



Management of Major Road Projects



VICTORIA

Victorian
Auditor-General

Management of Major Road Projects

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The Hon. Bruce Atkinson MLC
President
Legislative Council
Parliament House
Melbourne

The Hon. Ken Smith MP
Speaker
Legislative Assembly
Parliament House
Melbourne

Dear Presiding Officers

Under the provisions of section 16AB of the *Audit Act 1994*, I transmit my performance report on the *Management of Major Road Projects*.

Yours faithfully



D D R PEARSON
Auditor-General

1 June 2011

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Audit summary

Background

Over the past decade, Victoria has experienced rising urban road congestion and deteriorating public transport performance as its population and economy have grown.

To meet these challenges, the *Victorian Transport Plan* was designed to transform the transport network through a \$38 billion program of investments to address capacity constraints and improve performance. Half of this planned expenditure was for road projects.

The *Victorian Transport Plan* has now been superseded and its component projects are under review. This audit is therefore timely because it examined how effectively VicRoads and the Linking Melbourne Authority (LMA) managed a sample of major road projects:

- six of VicRoads major road projects, with capital costs that varied between \$41 million for the Goulburn Valley Highway duplication, to \$1.2 billion for the Western Ring Road upgrade
- the Peninsula Link project, included in the *Victorian Transport Plan* with an expected cost of \$750 million and subsequently developed and procured by LMA as a public private partnership.

For this audit, effective management means:

- providing a sound understanding of projects' costs, benefits and risks so government can decide if, and in what form, an investment should proceed
- managing the risks to deliver the intended benefits on time and within budget
- demonstrating that completed projects have achieved their intended outcomes and using this experience to better manage future projects.

Previous VAGO audits found weaknesses with the quality of information that agencies used to justify projects and their procurement, and how agencies measured project outcomes.

Conclusions

VicRoads and LMA have not been fully effective in developing the major road projects examined. Both agencies fell short of the standards required to reliably forecast traffic and estimate projects' economic benefits when informing the decision to proceed. LMA also had weaknesses in the way it had informed procurement decisions.

Addressing these weaknesses is critical because decisions have been made without a complete understanding of the consequences.

Based on the projects reviewed, neither organisation has effectively measured all of the intended project outcomes, but both are working to do this for current and future projects.

Once decisions had been reached on projects and their procurement, VicRoads and LMA effectively monitored and managed their delivery. This was evident from their performance in delivering projects close to their planned time lines and costs.

Findings

Informing project decisions

The strengths of both VicRoads and LMA's project development are in their rigorous engineering assessment of options and their methodical approach in estimating costs and adjusting these for the delivery risks.

The two major weaknesses were in the way VicRoads and LMA forecast traffic and estimated benefits for projects affecting congested parts of the road network. They did not adequately assess the traffic induced by these improvements, communicate the risks, or estimate the impact on the economic benefits.

These shortcomings create a risk of overestimating the benefits and giving decision-makers false confidence about the capacity of the project and the surrounding road network, to cope with future traffic. If these risks materialise then additional investment will be required to realise the benefits promised when justifying a project.

These weaknesses need to be addressed so that decision-makers can make a fully informed decision about whether to proceed with a project.

Informing procurement decisions

LMA followed the relevant Commonwealth and state guidelines in procuring Peninsula Link through a public private partnership (PPP).

However, VAGO cannot provide assurance about the reliability of the difference estimated between the costs of delivering the project through a PPP compared to a state-financed public sector comparator. Consequently, assurance cannot be provided that the project represents value-for-money.

LMA did not adequately test the assumptions underpinning its comparisons of the discounted costs of a state financed and managed project with a PPP because:

- LMA assumed cost differentials based on national studies and did not make adjustments for the project’s low risk profile and Victoria’s performance in delivering similar projects using traditional procurement methods.
- LMA did not test and communicate to decision-makers the sensitivity of the difference between the PPP and public sector comparator discounted costs to small changes in the PPP discount rate.

Measuring and improving performance

In terms of measuring projects’ outcomes:

- VicRoads had not done this adequately, but is acting prospectively to address this deficiency for current and future projects
- LMA has included measures directly related to the freeway’s operation in the Peninsula Link contract, and is working on a plan to monitor the wider traffic impacts.

Recommendations

| Number | Recommendation | Page |
|--------|---|------|
| | VicRoads should: | |
| 1. | assess the significance of induced traffic for all major road projects and take account of this when forecasting traffic and estimating the economic benefits | 15 |
| 2. | include sufficient information in its business cases on the reliability of the traffic impacts and economic benefits | 15 |
| 3. | apply minimum business case requirements when fast-tracking a major road project | 15 |
| 4. | review the lessons from all major projects on a scale commensurate with the size and complexity of the project and the likely benefits of the review | 15 |
| 5. | incorporate the adequate measurement of project outcomes in its project management processes. | 15 |
| | Linking Melbourne Authority should: | |
| 6. | improve the quality assurance of the transport modelling and the calculation of the economic benefits | 30 |
| 7. | improve the quality assurance applied in estimating and revising the public sector comparator cost | 30 |
| 8. | better inform decision-makers about the sensitivity of the comparison of the PPP and public sector comparator costs to small changes in the PPP discount rate | 30 |
| 9. | document a plan to measure outcomes as part of the project development. | 30 |

Submissions and comments received

In addition to progressive engagement during the course of the audit, in accordance with section 16(3) of the *Audit Act 1994* a copy of this report was provided to the Department of Treasury and Finance, VicRoads and Linking Melbourne Authority with a request for comments or submissions.

Agency views have been considered in reaching our audit conclusions and are represented to the extent relevant and warranted in preparing this report. Their full section 16(3) comments and submissions, however, are included in Appendix A.

1 Background

1.1 Introduction

Over the past decade, Victoria has experienced rising urban road congestion and deteriorating public transport performance as its population and economy have grown. These trends are expected to continue, posing a major challenge to stabilise and then improve transport performance.

The 2008 *Victorian Transport Plan* aimed to transform the transport network and meet these challenges. It set out \$38 billion of short-, medium- and long-term investments to relieve capacity constraints and improve performance. About half of the *Victorian Transport Plan's* planned expenditure was for road projects.

The *Victorian Transport Plan* has now been superseded and the government is reviewing the component projects as it develops long-term plans for the transport system.

1.2 Roles and responsibilities

1.2.1 VicRoads

VicRoads plans, develops and manages the major arterial road network and runs vehicle registration and licensing services. It defines a major project as one costing \$10 million or more.

It has managed all major road projects except for the Citylink, EastLink and Peninsula Link projects which were public private partnerships (PPP). Since January 2008 it has finished, or is completing, 46 major road projects with a combined capital cost of \$6.1 billion.

1.2.2 Linking Melbourne Authority

Linking Melbourne Authority (LMA) manages high-value projects that have the potential to be PPPs under the Partnerships Victoria policy. In Victoria PPPs have involved long-term contracts where the private sector has financed, built and operated infrastructure in return for payments tied to the successful delivery of services.

LMA was established as a special purpose statutory authority to carry out the EastLink project at a cost of \$2.5 billion. It has since procured Peninsula Link and is developing the WestLink project as an alternative east-west route to the Westgate Bridge.

1.3 Previous audit findings

In VAGO's 2007 audit report *Funding and Delivery of Two Freeway Upgrade Projects*, we found weaknesses with:

- the rigour of the problem definition and the quality assurance of the assumptions, traffic modelling and calculations used in the cost-benefit analysis
- the quality and depth of information used to recommend alliance procurements
- the measurement of intended project outcomes.

1.4 Audit objective and scope

This audit examined the management of major road projects by assessing whether VicRoads and LMA had:

- developed business case information that was sufficiently sound for the government to decide if, and in what form, investments should proceed
- monitored and managed project risks during delivery
- demonstrated that completed projects had achieved the intended outputs and outcomes.

For the audit we selected seven major road projects that:

- had a documented final business case
- included four completed projects which provided outcomes to review
- represented the types of road projects anticipated in the future.

The projects are listed in Figure 1A.

Figure 1A
Projects selected for detailed review

| Project | Capital (\$ mil) | Status | Procurement |
|---|------------------|-------------|---------------------------------|
| VicRoads | | | |
| Goulburn Valley Highway duplication—Arcadia section | 41 | Completed | Design and construct |
| Taylor's Road duplication | 46 | Completed | Design and construct |
| Western Highway Realignment Melton to Bacchus Marsh (Anthony's Cutting) | 200 | In progress | Alliance |
| Calder Freeway—Faraday to Ravenswood | 220 | Completed | Design and construct |
| Deer Park Bypass | 362 | Completed | Design and construct |
| Western Ring Road upgrade | 1 200 | In progress | Alliance / design and construct |
| Linking Melbourne Authority | | | |
| Peninsula Link | 750 | In progress | Public private partnership |

Source: Victorian Auditor-General's Office from VicRoads and Linking Melbourne Authority data.

The audit was conducted in accordance with Australian Auditing and Assurance Standards.

The cost of the audit was \$470 000.

1.5 Structure of the report

Part 2 reports the audit findings for VicRoads.

Part 3 assesses LMA's performance in developing the Peninsula Link project.

2 VicRoads

At a glance

Background

Six major road projects with a combined capital cost of \$2 billion were assessed to determine whether VicRoads has effectively developed, delivered and measured the outcomes of the major road projects it has managed.

Conclusion

The major areas of weakness were in the way VicRoads forecast traffic and the estimated benefits of road projects affecting congested parts of the road system. VicRoads had not adequately assessed the traffic induced by these improvements.

This shortcoming creates a risk of overestimating the benefits and giving decision-makers false confidence about the capacity of the improved road network to cope with future traffic.

Once projects were endorsed and procured, VicRoads has effectively monitored and managed their delivery. While VicRoads has not adequately measured the outcomes of projects assessed, steps are now being taken to do this for current and future projects.

Recommendations

VicRoads should:

- assess the significance of induced traffic for all major road projects and take account of this when forecasting traffic and estimating the economic benefits
- include sufficient information in its business cases on the reliability of the traffic impacts and economic benefits
- apply minimum business case requirements when fast tracking a major road project
- review the lessons from all major projects on a scale commensurate with the size and complexity of the project and the likely benefits of the review
- incorporate the adequate measurement of project outcomes in its project management processes.

2.1 Introduction

This part examines whether VicRoads:

- provided quality information on costs, benefits and risks to inform decisions about whether projects' should proceed, their preferred form, and how they should be procured
- adequately managed projects' risks during delivery
- measured project outcomes and used past experience to improve performance.

2.2 Conclusion

Unlike road authorities in the United Kingdom and New Zealand, VicRoads does not have adequate guidelines for forecasting traffic in congested areas. It risks underestimating traffic growth and misinforming decision-makers about whether improved roads will successfully relieve congestion. This was the case for the Pakenham and Hallam bypass projects.

Further, VicRoads has not measured the outcomes of past projects, however, action is now being taken to do so prospectively for current and future projects.

Nonetheless, once decisions have been made about the scope of projects and how they should be procured, VicRoads has been effective in delivering them.

2.3 Informing project and procurement decisions

VicRoads is responsible for providing reliable information about the impacts of project options including:

- whole-of-life costs compared with the cost of doing nothing
- expected benefits—how well each option meets the investment objectives compared with doing nothing
- risks and uncertainties in the cost and benefit estimates.

This information is needed to judge the value of an investment, and to decide whether it should proceed and how the option should be procured.

2.3.1 Informing the decision to proceed

The strengths of VicRoads project development are in its rigorous engineering assessment of options and its methodical approach in estimating costs and assessing how risks might affect them.

The areas where VicRoads needs to improve are in estimating option benefits and in providing sufficient information to decision-makers so they can understand the risks and uncertainties around these benefit estimates.

The Commonwealth government funded \$900 million of the \$1.2 billion cost of the Western Ring Road project under the Nation Building Program. VicRoads had to fast-track the business case so it could comply with the Commonwealth's stated desire that the project should start by December 2008.

As a result, VicRoads advised on the scope and procurement of the Western Ring Road before it had the depth and quality of information it would normally rely on and it did not adequately document the consequent risks and implications in the business case.

Further detailed design work and the contractual agreements covering more than half of the project budget mean VicRoads expects to deliver the project within the \$1.2 billion budget.

Information strengths

VicRoads is very capable in developing options for a proposed road investment based on engineering costs, community impacts, heritage and environmental constraints, and the risks generated by these factors.

VicRoads had a consistent and rigorous approach to developing options. For example, for the Western Highway realignment it rigorously reviewed the alternative options taking into account the costs, risks, environmental, heritage and local access issues.

It performed similarly across the other five projects in the audit sample.

Information weaknesses

The critical area for VicRoads to improve is in how it estimates project benefits, especially how it forecasts traffic changes for projects affecting congested roads.

Project documentation did not adequately explain the traffic forecasts, the economic benefit calculations or the uncertainties in the estimates.

VicRoads should adopt the practice of the United Kingdom and New Zealand who are more effective at modelling the traffic impacts of road investments, and measuring their economic benefits. Business cases should include sufficient information so that the reliability of the estimated traffic impacts and the economic benefits can be understood.

Deciding how to forecast a project's traffic impacts

The benefits of a road project are mainly in its effect on traffic levels and journey times. We use the term 'induced traffic' to describe the new traffic levels resulting from a road improvement.

Figure 2A summarises how a road improvement might induce, or increase traffic.

Figure 2A
Induced traffic responses to a road improvement

| The ways people and businesses could respond to a road improvement |
|---|
| Changing route —drivers make the same journeys but use the improved route. |
| Changing destination —drivers decide to travel to more distant destinations because the improvement makes the journey time acceptable. |
| Changing mode —public transport passengers switch to car because the improvement makes road travel more attractive than rail. |
| Changing time of travel —drivers decide to travel in the commuting peak period because the improvement reduces journey times to an acceptable level. |
| Making additional journeys —people are willing to make additional car journeys because of the improvement. |
| Relocated trip —people and businesses relocate to take advantage of the improvement and so make journeys that are new to the area. |

Source: Victorian Auditor-General's Office.

Changing route is likely to be the overriding traffic impact where an improvement has a small impact on overall journey times.

However, road improvements are likely to generate significant, additional traffic where:

- roads around the project are already congested in peak periods and further traffic growth is expected with or without the project going ahead
- the project is expected to significantly cut journey times
- an improvement is likely to stimulate residential and business development.

These circumstances occur where major road improvements are applied in urban areas with sustained population and economic growth. Such improvements require the application of models that can estimate these more diverse impacts. Failing to do this will significantly underestimate traffic and overestimate the economic benefits.

Figure 2B describes examples of major road projects in the United Kingdom and Melbourne where traffic was significantly underestimated.

Figure 2B
Examples of induced traffic

M25 orbital motorway—London

The M25 was opened in 1986 with three lanes in each direction. The government expected it to carry long-distance traffic wanting to bypass London and local suburban traffic for the rest of the twentieth century.

However, it was filled to capacity for parts of the morning and afternoon peaks soon after it opened. The traffic forecasts significantly underestimated demand and it was clear that it had to expand to avoid gridlock at peak periods. The forecasts failed to predict the volume of trips for short, local travel and the impact it would have on land use development next to the motorway.

Pakenham and Hallam bypasses—south-east Melbourne growth corridor

The Pakenham bypass opened in 2007 and the Hallam bypass in 2003. Both raised capacity on the M1 motorway connecting suburbs in the south-east of Melbourne with the Central Business District and Melbourne's middle and inner suburbs.

The traffic forecasts were significant underestimates:

- over most of Pakenham Bypass's length, daily traffic in 2010 exceeded the 2011 forecasts by over 50 per cent and was close to the volumes expected in 2031
- Hallam Bypass's daily traffic in 2010 overshot the 2011 forecasts from 15 to 29 per cent for different sections.

The consequences are serious. The decision to fund these schemes was based on an assumption that they would give sufficient capacity for the next 20 to 25 years. By 2010 this capacity had been used up.

Source: Victorian Auditor-General's Office from United Kingdom House of Commons Hansard and VicRoads information.

Overseas approaches to traffic forecasting and economic appraisal

In the United Kingdom and New Zealand, project proponents need to justify why they will not measure induced traffic for all but the smallest projects. The onus is on them to prove that major schemes will not have significant induced traffic impacts or, if they cannot, to use modelling approaches that will capture these impacts.

The United Kingdom Department for Transport has detailed guidance on, and standards for, transport modelling and economic appraisal on its Transport Analysis Guidance website.

The United Kingdom guidance:

- strongly recommends that proponents of projects worth over £5 million, or \$8 million, assess the potential effects of induced traffic on forecasts and benefits
- provides methods for the preliminary assessment, and criteria for deciding whether the induced traffic impacts can be ignored
- describes how to apply models to forecast induced traffic, and how to use the results to calculate the economic benefits
- includes methods for measuring and managing the uncertainty in traffic forecasting models.

The New Zealand Transport Agency publishes a comprehensive guide to transport modelling and economic appraisal. For complex projects in urban areas it recommends that proponents measure the induced traffic impacts or justify why these can be ignored.

Like the United Kingdom guide, it details how to apply transport models and measure the economic benefits.

The practices of these jurisdictions form a good starting point for improving the quality and rigour of the information used to guide decision-makers on forecast traffic, economic benefits and the uncertainty in these estimates.

VicRoads approach to forecasting traffic and benefits

VicRoads has paid insufficient attention to estimating and explaining the traffic forecasts and economic benefits that are critical to decisions about major road projects. VicRoads does not have the type of structured, consistent approach to forecasting and economic appraisal seen in the United Kingdom and New Zealand.

Its business cases and project scope reports had insufficient information describing and justifying the traffic forecasts and economic benefits. The documents did not explain the level of uncertainty in the estimates and the implications for the likely performance of the road network.

These gaps were most significant for major improvements in congested urban areas such as the Western Ring Road and Deer Park Bypass.

The business case for the Western Ring Road assumed the improvements would only affect drivers' route choice and not the number, location or timing of future journeys by road.

The scale of this project and the congested conditions it aimed to relieve made this assumption inappropriate. The consultants doing the rapid modelling assessment made this clear in their response to the request for tender. At the very least this assumption should have been sensitivity tested.

The business case did not address these risks and they were not raised with the VicRoads project review committee responsible for overseeing the project development. There was further transport modelling dated after the business case but there is no evidence that it had been used to better inform decisions and update the business case.

The Deer Park Bypass also has the potential to influence land use development and, in the longer term, where people live and work, and the time at which they travel. The transport modelling and project documentation did not adequately address the traffic forecasting risks, and the economic benefit calculations ignored induced traffic.

Managing the risks of fast tracking development

For the Western Ring Road project VicRoads fast-tracked the business case to meet the Commonwealth government aim that the project commence by December 2008.

The business case was put together rapidly, and proposed funding for:

- upgrading the two sections of the ring road with the worst congestion and safety problems
- planning the upgrading of the remaining sections of the ring road over 10 years, matching the expected Commonwealth funding profile.

A Department of Treasury and Finance gateway review confirmed that the VicRoads response to the immediate opportunity for Commonwealth funding was 'sensible'.

However, it criticised the VicRoads business case because it:

- did not demonstrate the expected depth or rigour of engineering design and transport modelling
- did not offer alternative options for the whole upgrade, but had time lines based on the expected 10 years of Commonwealth funding, assuming 10 years of works and disruption.

For fast-tracked projects VicRoads needs minimum standards for the business case and should clearly describe the effects of fast-tracking on the reliability of the business case information.

2.3.2 Informing procurement decisions

VicRoads is very experienced in procuring major road projects using design and construct contracts. These involve contractors responding with a fixed price to design and then build a project according to VicRoads detailed requirements. Its procurement guidelines for such contracts are comprehensive and clear, and project teams use them appropriately. VicRoads generally controls procurement via a contractor pre-qualification system, limiting tenderers to only those who are deemed appropriate for the contract.

The Western Highway realignment and one section of the Western Ring Road upgrade are being delivered through project alliances. These arrangements are structured so that the public and private sector teams work collaboratively to achieve the project outcomes. The participants share the benefits of good performance and share the costs when risks materialise. Alliances are less rigid and prescriptive than design and construct contracts.

The value-for-money arguments for these alliances were less clear than for design and construct contracts. In particular there was not enough detail comparing the expected costs and benefits of each alternative.

VicRoads used to rely on guidance from the Department of Treasury and Finance that has since been superseded. VicRoads is now updating its *Project Management Toolkit* to incorporate the current guidelines.

2.4 Managing projects' risks during delivery

2.4.1 Monitoring and managing risks

VicRoads adequately monitored and actively managed the risks for the four completed projects in the audit sample.

It procured the projects through design and construct contracts and governed them through project management and project leadership groups which identified and appropriately responded to emerging risks.

2.4.2 Keeping to planned time lines and budgets

Figure 2C reports the planned and actual time lines and costs for the four projects.

Figure 2C
Performance against time and budget

| Project | Completion | | | Capital costs | | | |
|-------------------------|------------|----------|---------------------|-----------------|----------------|--------------------|-----------|
| | Planned | Actual | Difference (Months) | Planned (\$mil) | Actual (\$mil) | Difference (\$mil) | (%) |
| Calder Freeway | June 09 | April 09 | -2 | 211 | 220 | +9 | +4 |
| Deer Park Bypass | Dec 09 | April 09 | -8 | 331 | 362 | +31 | +9 |
| Goulburn Valley Highway | Dec 07 | Feb 08 | +2 | 41 | 41 | 0 | 0 |
| Taylor's Road | June 08 | Nov 08 | +5 | 46 | 46 | 0 | 0 |
| Average | | | -0.75 | | | +10 | +3 |

Source: Victorian Auditor-General's Office from VicRoads data.

The figure shows acceptable performance. The projects were on average:

- less than one month early, ranging from eight months early for the Deer Park Bypass, to five months late for Taylor's Road
- three per cent over approved budgets, with at best two projects coming in on budget, and at worst a nine per cent overspend for the Deer Park bypass.

The larger deviations were due to risks materialising and having a greater impact than forecast. For example:

- the Deer Park bypass budget did not allow enough to cover the increase in land prices
- Taylor's Road was delayed because of the problems of working around utility cabling and close to a working railway
- the Calder Freeway project went over budget because it had not fully allowed for the geotechnical challenges of the site.

Although these isolated risks had not been adequately assessed during project development, once they emerged, VicRoads managed them effectively.

2.5 Measuring and improving performance

An effective organisation measures and learns from its past performance and uses the lessons to improve.

This involves:

- checking that contracts produce the intended outputs to specified standards
- identifying and sharing the lessons learnt from delivering each project
- measuring how well projects achieved their objectives by comparing before and after data that reliably measures the intended outcomes.

For the four completed projects examined in this audit, VicRoads had verified the quality of the outputs, identified and shared lessons for two of the four projects and had not adequately measured outcomes for any of these project. However, it is now developing and starting to apply practices to do these things for all current and future projects.

2.5.1 Quality assuring contractual outputs

Project managers are required to certify that the project conforms to the approved scope. All of the completed projects had documented this in project completion reports.

VicRoads' procedures for major projects require contractor performance reporting on a six-monthly basis, following Practical Completion and Final Completion for each contract. This assessment informs the VicRoads contractor prequalification system.

Separately to this, contractors are invited to provide an assessment of VicRoads' performance in managing the contract. This opportunity is provided at each stage that the contractor's performance is reviewed.

2.5.2 Understanding and applying the lessons learnt

VicRoads' project management toolkit describes the project post-implementation review as a way to learn lessons from the project once it is up and running. It then uses these lessons to improve the selection, design, delivery and operation of future projects.

VicRoads reviewed two of the four completed major road projects after implementation. They highlighted lessons that, if used, should improve future projects. However, it is not clear how lessons are communicated to other teams and, where appropriate, embedded in management processes.

VicRoads should complete post-implementation reviews for major road projects and provide guidance on their scope, and how they should be scaled, taking into account project size, complexity and performance, and also how the lessons should be applied.

Taylor's Road review

The Taylor's Road project was completed in 2008 and the 2010 review covered the lessons and the early road safety and traffic outcomes.

The most important lessons were about effectively managing the relocation of water, telecommunication, electricity and gas infrastructure, and working within a live railway reservation. The review offered practical tips. For example, it noted that an early and detailed understanding of the location of utilities, such as water and gas pipelines, and how these might affect the project design, was needed. This information meant that these assets could be relocated before construction started, saving time and money.

Deer Park Bypass

The project's 2010 learning and closure report focused on its success and ways to improve applying alliance-type collaboration within the structure of a design and construct contract.

2.5.3 Measuring and learning from project outcomes

None of the audited VicRoads projects adequately tracked and reported on outcomes. For example, the outcomes of a major road project might be to reduce the number and severity of crashes and improve vehicle speeds, journey times and reliability.

To track outcomes, VicRoads would need to:

- plan how to measure outcomes as part of the project development
- collect relevant, appropriate and reliable baseline data before implementation
- collect sufficient data to track the effect of the project over time
- report the findings and their implications for future projects.

VicRoads is working towards this by:

- developing program and organisational outcome measures
- trialling evaluation frameworks for projects such as Taylor's Road and the Western Ring Road
- recruiting a manager for program outcomes.

VicRoads should consolidate this work by incorporating effective project outcome measures in its project management toolkit.

Recommendations

VicRoads should:

1. assess the significance of induced traffic for all major road projects and take account of this when forecasting traffic and estimating the economic benefits
 2. include sufficient information in its business cases on the reliability of the traffic impacts and economic benefits
 3. apply minimum business case requirements when fast tracking a major road project
 4. review the lessons from all major projects on a scale commensurate with the size and complexity of the project and the likely benefits of the review
 5. incorporate the adequate measurement of project outcomes in its project management processes.
-

3 Linking Melbourne Authority

At a glance

Background

The Linking Melbourne Authority (LMA) was responsible for developing the Peninsula Link project and is now overseeing its delivery through a public private partnership (PPP). This 25 kilometre freeway allows traffic to bypass Frankston in south-east Melbourne by linking the EastLink and Mornington Peninsula freeways.

Conclusion

LMA did not adequately inform decision-makers about whether the Peninsula Link project should proceed, and how it should be procured. Consequently, assurance cannot be provided that the procurement represents value-for-money.

There were weaknesses in the way LMA informed the decision to proceed because, the estimate of the economic benefits was unreliable and it did not adequately communicate this uncertainty to decision-makers.

There were also weaknesses in how LMA informed procurement decisions because:

- of the way it estimated the cost of state delivery as represented by the public sector comparator (PSC) and because
- it did not test the sensitivity of the relative costs of the PSC and PPP bids to small changes in the PPP discount rate.

LMA is effectively managing the delivery of Peninsula Link and. It has also demonstrated that it had measured the wider traffic impacts of EastLink, a previous PPP project, and was preparing a plan to do this for Peninsula Link.

Recommendations

LMA should:

- improve the quality assurance of the transport modelling and the calculation of the economic benefits
- improve the quality assurance applied in estimating and revising the public sector comparator cost
- better inform decision makers about the sensitivity of the comparison of the PPP and PSC costs to small changes in the PPP discount rate
- document a plan to measure outcomes as part of the project development.

3.1 Introduction

The Linking Melbourne Authority (LMA) developed the Peninsula Link project in 2008. This development work informed the 2009 decision to procure this bypass of Frankston as a new, freeway standard road through a public private partnership (PPP).

Since the selection of a private sector partner in January 2010, LMA has been responsible for overseeing the construction of the bypass.

This part examines whether LMA:

- provided quality information on costs, benefits and risks to inform decisions about whether the Peninsula Link project should proceed and, if so, in what form and how it should be procured
- adequately managed the projects' risks to date during delivery
- put in place the arrangements needed to measure the project outcomes.

3.2 Conclusion

LMA did not adequately inform decision-makers about whether the Peninsula Link project should proceed, and how it should be procured. Consequently, assurance cannot be provided that the procurement represents value-for-money.

In terms of informing the decision to proceed with the project, LMA's estimates of the economic benefits were unreliable because of weaknesses in the way it forecast traffic and calculated the benefits. LMA needs to better assure the quality of these estimates and communicate their limitations and uncertainties to decision makers.

There were weaknesses in the way LMA estimated and revised the PSC costs. Firstly, the PSC cost that informed the procurement decision was not adjusted for the project's low-risk profile and Victoria's past performance in delivering similar projects. Secondly, LMA had to revise upward the PSC cost by 45 per cent and LMA needs to improve its quality assurance to avoid changes of this scale and timing.

LMA followed the applicable guidelines in determining the discount rates used to discount the costs of the PPP bids and the PSC. However, the evaluation was sensitive to small changes in the final PPP discount rate and LMA did not, as recommended in the guidelines, test this sensitivity or communicate the results to decision-makers.

LMA is effectively managing the delivery of Peninsula Link and. It has also demonstrated that it had measured the wider traffic impacts of EastLink, a previous PPP project, and was preparing a plan to do this for Peninsula Link.

3.3 Informing project and procurement decisions

LMA was responsible for informing decisions about Peninsula Link's design and procurement. To do this effectively, it needed to obtain and provide complete and accurate information on the:

- whole-of-life costs, comparing these to the costs of not proceeding
- expected benefits of each option compared with the status quo
- risks and uncertainties of the cost and benefit estimates.

LMA's procurement analysis informed the decision to deliver the project as a PPP. Under the PPP, the private sector partner builds and maintains the road for a period of 25 years. In return, it receives a quarterly payment that depends on the freeway's availability for use by traffic.

3.3.1 Informing the decision to proceed

The strengths of Peninsula Link were its rigorous engineering, environmental and risk assessments of the options for building the bypass.

However, LMA's weaknesses were similar to those we found for the other projects reviewed. For Peninsula Link, LMA did not:

- apply sufficient rigour to forecasting future traffic and estimating the economic benefits of the preferred option
- provide sufficient information to decision-makers so they could understand the risks and uncertainties around these estimates.

Weaknesses affecting the economic benefits

Traffic forecasting

LMA intended to forecast traffic for Peninsula Link in the same way that VicRoads had for the Western Ring Road and Deer Park Bypass, assuming that drivers responded to the improvement by changing their travel routes. This ignored the potential traffic growth from changes in journey destination, mode and time of travel, and the additional journeys generated where Peninsula Link stimulated new development.

For Peninsula Link, current and forecast traffic congestion, and the significant impact of the project on journey times, meant ignoring these factors would underestimate traffic and overestimate the economic benefits.

While LMA agreed that it should have tested the validity of this approach, a previously undiscovered error in its modelling was detected as a direct result of audit inquiries. This shortcoming meant it had partially, and unintentionally, included these wider traffic impacts in its traffic estimates. This meant the traffic forecasts for the, with and without Peninsula Link scenarios both included the higher demand expected once the project was in place.

This overestimates the economic benefits because:

- applying the demand generated by Peninsula Link to a network without the project assumes increased congestion and overstates the scale of the problem
- introducing Peninsula Link would then overestimate congestion relief and travel time savings and the economic benefits.

LMA claimed that this overestimate would be outweighed by benefits it had omitted from the analysis. These included the improved reliability of travel and the impacts of the project on productivity and economic growth. As the size of these omitted benefits was not assessed by LMA this claim cannot be substantiated.

Further uncertainty affecting the economic benefits

LMA relied on estimates of performance averaged over a 24-hour period to calculate the economic benefits. This will underestimate the economic benefits and the more accurate approach is to measure the economic benefits separately for the peak and off-peak periods before summing the results. The level of congestion in the peak commuting periods means the calculation based on average performance across the day will underestimate the economic benefits.

Reliability of the economic benefits

VAGO does not support LMA's position that it properly applied the Department of Transport's guidance material in modelling the traffic for the project. Since 2005 the department's guidance has included the requirement to consider induced traffic and to test the sensitivity of the economic benefits to changes in demand.

The department's 2008 guidelines mandate consistency with the *National System Guidelines for Transport System Management in Australia*. In addition to considering induced traffic and sensitivity testing, these guidelines recommend the separate modelling of peak and off-peak travel.

LMA could not reliably substantiate its estimate of the project's economic benefits. For future projects, LMA needs to:

- improve the quality of its traffic forecasts and benefit estimates
- better communicate the limitations and uncertainties of these forecasts and estimates to decision-makers.

3.3.2 Informing procurement decisions

In assessing the procurement options and recommending a preferred bidder, LMA followed Infrastructure Australia’s *National Public Private Partnership Guidelines* that were adopted by both the Commonwealth and Victorian governments in December 2008.

However, the information that guided decisions did not provide adequate assurance about their reliability or likely range of the risk-adjusted costs. LMA should:

- improve the rigour and better assure the quality of its estimates of the PSC costs
- better inform decision-makers about the uncertainties affecting the discount rate applied to calculate the PPP costs.

Summary of the Peninsula Link procurement

LMA adhered to the following structure for evaluating the PPP bids:

- three evaluation panels covering urban design, technical issues and commercial issues assessed the work of project teams
- an executive panel including LMA and the Department of Treasury and Finance (DTF) representatives and technical experts signed off a selection report and recommended the preferred bidder to LMA’s CEO and Board
- LMA’s CEO and board made recommendations to the Minister for Roads and Ports before these were put to government for approval.

Figure 3A summarises the procurement time line.

**Figure 3A
Peninsula Link procurement milestones**

| Event | Decision or milestone |
|-------------|---|
| 19 Feb 2009 | Government decided to procure through a PPP |
| 17 Jun 2009 | Government endorsed the release of requests for proposals |
| 20 Oct 2009 | Tenderers submitted initial PPP bids |
| 7 Dec 2009 | Tenderers submitted final PPP bids |
| 14 Dec 2009 | LMA executive panel endorsed a PPP bid selection report |
| 15 Dec 2009 | LMA board signed off on the preferred PPP bid |
| 22 Dec 2009 | LMA amended the selection report revising the discount rate |
| 22 Dec 2009 | Government approved changes to the PSC |
| 14 Jan 2010 | Government endorsed the preferred bidder |

Source: Victorian Auditor-General’s Office from Linking Melbourne Authority information.

Estimating the public sector comparator costs

LMA compared the cost of the PSC to the cost of PPP delivery to inform decisions in:

- February 2009, to procure Peninsula Link as a PPP
- January 2010, to select the successful PPP bid.

We identified weaknesses in how LMA estimated and revised the cost of the PSC and LMA needs to improve how it assures the quality of these estimates.

Informing how Peninsula Link should be procured

LMA informed the decision in February 2009 to procure the project using a PPP through a qualitative and quantitative assessment of the procurement options. Calculating and comparing the costs of a PPP with a state delivered PSC exceeded the Infrastructure Australia guidelines that required a qualitative review.

Once LMA decided to include these costs it was responsible for providing reliable estimates using the best available information. However, we found that the cost differentials it applied to the PPP and PSC options did not reflect the specific characteristics of Peninsula Link—a low risk project being delivered in Victoria.

It used national differentials that should have been modified to take into account the project's low risk profile and VicRoads track record in delivering major road projects. This would have had the effect of bringing the comparative cost of the two procurement options closer together.

LMA calculated the costs of a state-financed PSC and the PPP by:

- employing an independent cost consultant to estimate the raw cost of building, maintaining and operating Peninsula Link
- adjusting these costs using national PPP benchmarking studies to reflect the inefficiencies of state delivery and the innovation and efficiency benefits of a PPP.

Based on its analysis of these benchmarking studies, LMA expected the PPP would be cheaper than the PSC by 23 per cent for the capital costs and by 17 per cent for the ongoing maintenance costs.

Based on LMA's advice, a PPP, with payments contingent on the road being available for use, was chosen over the PSC because the PPP was expected to be:

- cheaper, costing 1.7 per cent less in terms of its discounted costs
- quicker to complete by between 12 and 18 months
- more flexible to fund, allowing government to spread the costs over time.

LMA informed us that it was not aware of readily available empirical data about VicRoads track record of delivering projects of this scale. VAGO considers VicRoads record in delivering major projects similar to Peninsula Link as relevant to estimating the cost differentials. Especially for major projects involving the construction of new roads in greenfield situations.

VicRoads and LMA have worked closely on a range of issues during the development and delivery of Peninsula Link. However, in this instance LMA did not request this information from VicRoads and should have done so. LMA should have reflected VicRoads performance on similar projects and the low risk nature of the project in its cost estimates.

Informing the choice of successful bidder

The cost of the PSC was progressively reviewed and refined, but had changed by less than 2 per cent between the procurement decision in February 2009 and the release of the request for proposals in June 2009.

However, in mid-December 2009 LMA recommended that government approve a 45 per cent increase in the discounted PSC costs used to benchmark the value-for-money of the PPP bids submitted on 7 December.

This discounted PSC cost in June 2009 dollars, excluding retained risk increased from \$590 million to \$858 million (45 per cent), and this \$268 million increase comprised:

- \$53 million for unavoidable scope changes to address environmental and access issues
- \$71 million because contractor overheads and profit had been omitted
- \$74 million for changes to the risk-adjusted cost
- \$43 million for additional periodic maintenance
- \$27 million for other smaller amendments.

The Infrastructure Australia guidelines allow amendments to the PSC after bids are received where material errors or misestimates are uncovered as part of the evaluation process.

However, the scale of the change; its timing so late in the procurement process; and the nature of the amendments; demonstrate a lack of prior rigour in calculating the PSC and the need to better assure the quality of these estimates during the procurement.

The \$53 million in scope changes to comply with legislative requirements was unavoidable. However, LMA needs to improve its quality assurance to resolve the omission of overheads and profits, changes to the risk adjustment and amendments to maintenance costs earlier in the process.

Setting and revising the public private partnership discount rate

In January 2010 LMA recommended that government accept a PPP bid that:

- addressed the project's objectives
- cost \$849 million in June 2009 dollars, which was \$9 million (1.05 per cent) less than the \$858 million cost for the benchmark PSC.

LMA followed Infrastructure Australia's guidelines in applying:

- a discount rate of 8.69 per cent to the PPP costs, to allow for the systematic or market-wide risks it assumed were included in the PPP costs
- a risk-free discount rate of 6.20 per cent to the PSC costs, because they exclude any allowance for the systematic risks.

These risks represented a discounted cost of \$288 million, and the difference between the PPP and PSC costs was sensitive to small changes in the PPP discount rate.

While understanding the significance of the systematic risks in terms of their potential to affect the calculation of comparative costs, LMA did not:

- test the sensitivity of the relative costs of the PPP bids and the PSC to small changes in the final PPP discount rate
- inform decision-makers about these sensitivities.

The Infrastructure Australia guidelines

The December 2008 guidelines affected how agencies incorporated systematic risks within the PSC and PPP bid costs. Systematic risks are market-wide risks not specific to the project and typically include the following categories:

- **demand risk**—where traffic levels exceed expectations resulting in higher maintenance costs
- **inflation risks**—where inflation exceeds levels allowed for in PPP bids
- **economic downturn risk**—where a downturn affects costs by, for example, a sub-contractor folding and having to be replaced
- **residual value risk**—where at the end of the contract the asset's worth or resale value is different to what was expected.

Before these Infrastructure Australia guidelines, agencies applied a uniform discount rate to the PSC and the PPP costs, assuming they included allowances for systematic risks. The Infrastructure Australia guidelines require that agencies apply:

- a risk-free rate to the PSC costs because they should now not include an allowance for the systematic risks
- an amended rate to the PPP bids, assuming that the PPP costs include an allowance for bearing the systematic risks transferred through the contract.

Figure 3B summarises the guidelines.

Figure 3B
Summary of the Infrastructure Australia guidelines

| |
|---|
| <p>The types of discount rate described in the guidelines</p> <p>The guidelines require the calculation of:</p> <ul style="list-style-type: none"> • a risk-free discount rate • a project discount rate—the risk-free rate plus an allowance for systematic risks based on the type of industry and project • a PSC discount rate set at the risk-free rate • PPP discount rates—an adjustment to the project discount rate to reflect the proportion of the systematic risks transferred to each bidder. <p>Calculating risk-free and public sector comparator discount rates</p> <p>The risk-free rate should reflect the return demanded by investors on risk-free investments and in Victoria is set to equal the return on 10-year treasury bonds.</p> <p>The PSC rate should be set equal to the risk-free rate and the PSC costs should not include an allowance for the systematic risks.</p> <p>Calculating the project discount rate</p> <p>For a non-tolled road the guidelines recommend a project discount rate equal to the risk-free rate plus 3 per cent to reflect all systematic risks.</p> <p>The default rates should be used in most circumstances, except for particularly large or unique projects where a ‘bottom up’ assessment of systematic risk should be applied.</p> <p>Calculating the PPP discount rate</p> <p>This involves determining the systematic risks transferred to the private sector by:</p> <ul style="list-style-type: none"> • weighting the demand, inflation, economic downturn and residual risk categories to determine how the systematic risks are distributed across these categories • estimating the proportion of the risks in each category that are transferred to the private sector • applying these weights and proportions to calculate how the risk-free rate should be adjusted to reflect the systematic risks in the PPP discount rate. <p>Sensitivity testing</p> <p>The guidelines recognise that applying a single discount rate incorporating systematic risk based on an industry/project profile is an approximation that needs to be sensitivity tested.</p> <p>The guidelines prescribe specific sensitivity tests and, where the evaluation results are sensitive to small changes in the discount rate, state that practitioners should:</p> <ul style="list-style-type: none"> • consider determining a more precise discount rate from first principles • place more reliance on qualitative value-for-money measures in the assessment. |
|---|

Source: Victorian Auditor-General's Office from Infrastructure Australia's *National Public Private Partnership Guidelines*.

Linking Melbourne Authority's application of the Infrastructure Australia guidelines

LMA followed the Infrastructure Australia guidelines in calculating discount rates except that it did not test the sensitivity of the evaluation results to small changes to the final discount rate of 8.69 per cent.

The Department of Treasury and Finance (DTF) supported LMA's application of the guidelines and endorsed the decisions about the choice of the final rate used to discount the PPP bids.

Figure 3C shows that LMA:

- calculated three different PPP discount rates during the procurement process and explained these estimates in accompanying reports
- commissioned jointly with DTF an independent review of the way it calculated the final rate used to inform government's decision about the preferred bidder.

Figure 3C
Discount rate calculations using the guidelines

| Date and report | Discount rates (percentages) | | | Comments |
|--|------------------------------|---------|------|---|
| | Risk-free and PSC | Project | PPP | |
| 11 June 2009— discount rate paper | 6.20 | 9.20 | 7.50 | Agreed rates when the RFP was released |
| 8 December 2009— rate amendment paper | 6.20 | 9.80 | 9.28 | Informed selection report endorsed by the executive panel and the presentation to the LMA Board |
| 22 December 2009— rate amendment paper (final) | 6.20 | 9.20 | 8.69 | Informed revised selection report and the presentation to government on 14 January |
| 24 December 2009— Independent rate review | NA | NA | NA | Reported whether PPP discount rate was calculated according to the guidelines |

Source: Victorian Auditor-General's Office from Linking Melbourne Authority data.

In June 2009 LMA set a PPP discount rate at 7.5 per cent. The PPP discount rate was revised upwards on 8 December to 9.28 per cent by:

- assuming that the systematic risks for the project required a 360 basis point increase, from 6.2 per cent to 9.8 per cent rather than the 300 basis points assumed in the guidelines for a non-toll road
- then changing the category weights and the risks transferred to the private sector to arrive at a risk adjusted rate of 9.28 per cent for the PPP.

Using a higher discount rate to establish present value in today's dollars, reduces the computed cost of a proponents bid.

The evaluation panel reviewed and signed off a selection report, dated 14 December, that included PPP costs calculated using a discount rate of 9.28 per cent. The report included sensitivity tests about the impact of changes to the PPP discount rate on the PPP discounted costs. The tests showed that varying this discount rate by 50 basis points did not affect the evaluation result.

A summary of the results was presented to the LMA board for its approval on 15 December. This included the total discounted costs of the PSC and the PPP bids. It did not provide information on the sensitivity testing.

Subsequent to board approval LMA amended the PPP discount rate to 8.69 per cent on 22 December by:

- reverting to the guideline's assessment that this type of project had systematic risks equivalent to a 300 basis point increase in the discount rate
- retaining assumptions that meant more of this risk was transferred to the private sector compared to what it had assumed in June 2009.

The effect of a reduction in discount rate is an increase in the cost of the proponent's bid in terms of its present value.

LMA:

- recalculated the PPP costs using the revised rate of 8.69 per cent
- amended the selection report to reflect these changes
- presented a summary of the results to government in January 2010 to inform its approval of the preferred PPP bid.

LMA did not:

- get the evaluation panel to endorse the updated results
- present the updated results to the LMA board
- test the sensitivity of the PPP costs to small changes around the updated rate.

Sensitivity testing the evaluation to changes in the PPP discount rate

LMA followed the default method set out in the Infrastructure Australia guidelines for calculating the PPP discount rate by applying a sector-based, top down approach to measuring the systematic risks. DTF endorsed its application of the guidelines.

However it did not, as recommended by the guidelines, sensitivity test the evaluation results to small changes in the final PPP discount rate.

The guidelines recommend that all assessments:

- generate a PPP cost range by lowering and raising the PPP discount rate by between 50 and 100 basis points
- calculate the breakeven PPP discount rate, at which the discounted cost of the PPP and PSC are equal, and compare this with the PPP discount rate used.

If sensitivity testing shows that the evaluation results are sensitive to small changes in the discount rate, the guidelines recommend that agencies:

- consider determining a more precise discount rate from first principles
- place more reliance on qualitative value-for-money measures in the assessment.

LMA completed sensitivity testing for the superseded discount rate of 9.28 per cent and found that the result was not sensitive to a change of plus or minus 50 basis points.

Reducing the discount rate to 8.69 per cent means the evaluation was now sensitive to small changes in the discount rate. For example, by reducing the PPP discount rate by 50 basis points, from 8.69 to 8.19 per cent, the discounted costs of the preferred PPP bid increase from \$849 million to about \$899 million. This is above the benchmark PSC cost of \$858 million. The PPP and PSC discounted costs are equal at a breakeven discount rate of 8.4 per cent.

The review jointly commissioned by LMA and DTF confirmed that it had followed Infrastructure Australia's guidelines in setting the discount rate at 8.69 per cent. However, the review noted that the guidelines require the application of judgement, and recommended that LMA test the sensitivity of the results in determining the appropriateness of the discount rate.

LMA did not sensitivity test the final PPP discount rate and VAGO found no documentation informing decision-makers about the sensitivities of the PPP discounted costs to small changes around the final discount rate.

3.4 Managing projects' risks during delivery

3.4.1 Managing risks

The board and management have, to date, adequately managed project risks. Management has regularly updated the risk register identifying relevant risks, advised the board about important risks and taken action to mitigate these.

3.4.2 Keeping to planned time lines and budgets

Peninsula Link is contracted to be completed by December 2012 and is scheduled to open for use in early 2013.

Recent rain has caused some minor delays in the delivery of the project. However, LMA's experience with EastLink, which was delivered on budget and five months early, suggests that the Peninsula Link project should still be delivered on time and within budget.

3.5 Measuring and improving performance

LMA has identified lessons from past projects but needs to form comprehensive plans during the project development to measure the intended outcomes. Currently the contract-based performance measures do not go beyond the outcomes directly affecting the project.

3.5.1 Reviewing and applying the lessons learnt

LMA's board completed a report on governance lessons learnt in December 2008, following the delivery of the EastLink project in June 2008.

In addition to recommendations about confidentiality and the composition and operations of the organisation and board, lessons the review found include that:

- large projects are best executed by separate project specific entities with oversight by a dedicated board
- direct and timely communication with, and decision-making by, the minister and government greatly assist project progress and show to private sector bidders a professional approach by government
- project plans need to reflect sufficient time and budget to allow high quality work supporting a thorough business case which is well aired within government, has had expert review and properly reflects current industry costs and views
- risk management processes should be established at the outset, and must be used as an integral part of both strategic and day to day management and governance activities.

LMA have applied these lessons to Peninsula Link. However, our findings suggest further improvement is needed, particularly in developing a thorough business case with adequate expert review.

3.5.2 Measuring and learning from projects' outcomes

Peninsula Link's contract to build, operate and maintain the freeway included requirements for measuring performance directly related to the operation of the freeway. However, the contract does not provide for measuring objectives with outcomes going beyond the direct operation of the freeway, such as decongestion on the road network surrounding Peninsula Link.

The primary outcome of the project is to achieve a continuous and balanced road network, with sufficient capacity in the Frankston—Mornington Peninsula corridor to meet future travel demands in accordance with government's growth projections and policies.

As stated in the procurement gateway review, the detailed project objectives take into account both the technical and commercial aspects and include:

- delivery of a major integrated transport route serving the Frankston and Mornington Peninsula corridor in a safe and efficient manner

- protecting, and where possible enhancing, the environment in relation to the project
- enhancing the amenity of the project corridor through high quality urban design, noise attenuation solutions, and socially sensitive construction and operations management
- delivering value-for-money for the state and road users, through innovative design, optimum risk allocation between the project parties, and a whole-of-life approach to the design and operation of the road
- ensuring transparent and efficient dealings with all parties associated with the project
- delivering a fully operational Peninsula Link as soon as practicable.

Additionally, LMA have published that the Peninsula Link project would:

- save drivers time with a full trip between Mt Martha and Carrum Downs taking 17 minutes, a saving of up to 40 minutes in peak periods
- create a tourism boost to the Mornington Peninsula with local business to benefit from more visitors to the region.

LMA has advised that it is following a similar outcomes measurement process for Peninsula Link as it had used for the EastLink project. It is evident that LMA has started to develop a plan to measure outcomes by the time the Peninsula Link project is delivered. However, for future projects LMA should document a plan to measure outcomes as part of the project development and assemble relevant, appropriate and reliable baseline data before implementation.

Recommendations

Linking Melbourne Authority should:

6. improve the quality assurance of the transport modelling and the calculation of the economic benefits
 7. improve the quality assurance applied in estimating and revising the public sector comparator cost
 8. better inform decision-makers about the sensitivity of the comparison of the PPP and public sector comparator costs to small changes in the PPP discount rate
 9. document a plan to measure outcomes as part of the project development.
-

Appendix A.

Audit Act 1994 section 16— submissions and comments

Introduction

In accordance with section 16(3) of the *Audit Act 1994* a copy of this report was provided to the Department of Treasury and Finance, VicRoads and Linking Melbourne Authority with a request for submissions or comments.

Responses were received as follows:

- The Department of Treasury and Finance 32
- VicRoads 36
- Linking Melbourne Authority 37

Further audit comment:

- Auditor-General's response to the Department of Treasury and Finance 34
- Auditor-General's response to Linking Melbourne Authority..... 39

The submissions and comments provided are not subject to audit nor the evidentiary standards required to reach an audit conclusion. Responsibility for the accuracy, fairness and balance of those comments rests solely with the agency head.

Submissions and comments received

RESPONSE provided by the Acting Secretary, Department of Treasury and Finance



Department of Treasury and Finance

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25 May 2011

Mr D D R Pearson
Auditor-General
Level 24, 35 Collins Street
MELBOURNE VIC 3000

Dear Mr Pearson

Response to Proposed Audit Report on the *Management of Major Road Projects*

Thank you for the opportunity to provide formal comments on the proposed Auditor-General's Report (the Report), *Management of Major Road Projects*, prior to its finalisation and tabling in Parliament in June 2011. We welcome scrutiny and review of projects by the Auditor-General as a constructive process for enhancing project delivery outcomes. I would like to make the following comments in response and for inclusion in the final Report to be tabled in Parliament.

DTF's comments are in relation to statements in the Report about the application of the *Partnerships Victoria* framework and the *National Public Private Partnership Guidelines* (National PPP Guidelines). If misinterpreted, these statements are likely to have a negative impact on perceptions of the effectiveness of public private partnerships (PPPs) and private financing more generally, as a procurement model for public infrastructure. DTF's concerns relate to:

- suggestions overall value for money was not achieved for the Peninsula Link project; and
- the calculation on page 24 that is out of context and not meaningful and which could lead to a misinterpretation of private sector financing of public infrastructure.

I also have comments on the level of consultation with DTF on the Report as well as Recommendation 7.

1. Consultation with DTF

I am pleased that the Report reflects the role that DTF played in the Peninsula Link project. However, DTF would have preferred additional opportunity to accurately review and discuss some of the technical matters underpinning the *Partnerships Victoria* model in the Report as well as the application of guidelines and private financing of infrastructure more broadly. Some of these technical matters were touched on briefly in discussions between DTF and the Auditor-



RESPONSE provided by the Acting Secretary, Department of Treasury and Finance – continued

General's team, but without an opportunity to review any updated drafts, DTF's concerns remain as expressed in points 2 and 3 of this letter.

2. Value for money

DTF has previously expressed concerns about the use of the term 'value for money' in audit reports, as it has a specific meaning in the domestic and international PPP markets. The concept of value for money, as set out in the National PPP Guidelines adopted by Victoria, encompasses both a quantitative and qualitative assessment. The Project Summary for the Peninsula Link project, approved by this Department, sets out the quantitative comparison of the Public Sector Comparator (PSC) to the service payments to be made to Southern Way (the successful proponent). The Project Summary notes that when this comparison is made, that if "the cost of the service payments to be paid to Southern Way was lower than the cost of delivery by the State, it was an indication that, at face value, the bid represents value for money."

A range of cost issues and discount rate matters were identified late in the procurement. However, these were addressed prior to a final decision by the then government. As set out in the Report, the procuring agency followed the National PPP Guidelines in assessing and recommending a preferred bidder. DTF remains satisfied that the Project represents value for money for the State, having regard to both quantitative and qualitative measures.

3. Systematic risk assessment

The discussion around the \$288 million amount set out on page 24 appears to be about the sensitivity of the PPP bid and the PSC to changes in the discount rate. The calculation of this amount does not seem to specifically support this discussion and is potentially confusing in this context. The Report already covers issues related to the sensitivity analysis of the discount rate elsewhere.

This form of quantification is not discussed nor required by the National PPP Guidelines. The assessment of systematic risk is a more complex technical matter than as suggested in the Report. The use of the risk free rate to calculate the PSC is consistent with the National PPP Guidelines, but this is used in the context of relative ranking and comparison of private sector bids as well as an indicator of quantitative value for money.

Additionally, the representation of the \$288 million calculation may perpetuate public misinformation about the costs of private sector finance and public sector procurement. The calculation of this amount is likely to be misinterpreted and taken out of context.

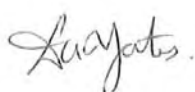
4. Recommendation 7 – Quality assurance improvements

I note that recommendation 7 for the Linking Melbourne Authority refers to improving the quality assurance applied in estimating and revising the PSC. I am pleased to advise that since January 2010, it is a requirement for procuring agencies to conduct a PSC internal quality assurance review workshop. This is part of the *Partnerships Victoria* requirements to reduce the risk of error or inaccuracy by cross-checking the PSC outputs against the inputs and assumptions, prior to the release of the Request for Proposal. DTF will continue to work with procuring agencies to reduce risks in the estimation of the PSC.

RESPONSE provided by the Acting Secretary, Department of Treasury and Finance – continued

If you require further information or would like to discuss the contents of this letter, please contact Jason Loos on 9651 2699 or by email on jason.loos@dtf.vic.gov.au.

Yours sincerely



Dean Yates
Acting Secretary

cc: Ray Winn, Director, Performance audit, VAGO
Jason Loos, Director, *Partnerships Victoria*, DTF

Auditor-General's response to Department of Treasury and Finance

1. Consultation with DTF

The proposed audit was first discussed with the Department of Treasury and Finance (DTF) on 8 July 2010 during the audit planning phase. However, DTF was not included as an auditee because at that stage it was not considered directly involved in managing the road projects included in the audit.

Late in the audit conduct phase however, Linking Melbourne Authority (LMA) asserted that DTF played a critical role in decisions about the public private partnership (PPP) discount rate. DTF was contacted and acknowledged this role. Accordingly DTF was then provided with access to the relevant sections of the preliminary draft of the report on 29 April 2011.

In finalising the proposed draft report issued under section 16(3) of the *Audit Act 1994*, account was taken of the feedback provided by DTF on the preliminary draft. The proposed draft report was issued on 12 May 2011 for a response by 26 May 2011 in accordance with the time frames set down in the *Audit Act 1994*.

The issues about value for money and systematic risk described in DTF's response were raised after the proposed draft report was issued. Nevertheless these matters were discussed with DTF staff who were advised on 18 May 2011 of the basis for the report's findings.

The following comments reiterate the advice we have provided DTF.

Auditor-General's response to Department of Treasury and Finance – continued

2. Value-for-money

We agree with DTF's comments that:

- value-for-money encompasses both a quantitative and qualitative assessment
- if the cost of the preferred bid is lower than the cost of delivery by the state then, at face value, the bid represents value-for-money.

We agree that LMA followed the national guidelines except when the PPP discount rate was changed late in the procurement process. Pages 27 and 28 of the report explain that the final evaluation results were not sensitivity tested for small changes in the final PPP discount rate as recommended under the guidelines. Thus decision-makers were not informed of this uncertainty about the cost of the preferred PPP bid when comparing this with the cost of the Public Sector Comparator. Without evidence that such an analysis was undertaken audit cannot provide assurance that the project represents value-for-money.

3. Systematic risk assessment

We refer the reader to pages 24 to 28 of the report which explains what systematic risk is, how it was calculated and its relevance to the audit's findings.

RESPONSE provided by the Chief Executive, VicRoads.



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Mr D'D R Pearson
Auditor General
Level 24, 35 Collins St
MELBOURNE, VIC 3100

Dear Mr Pearson

**AUDIT ACT, 1994, s16(3) – PROPOSED AUDIT REPORT
MANAGEMENT OF MAJOR ROAD PROJECTS**

I refer to your letter dated 12 May 2011, regarding the Audit Act 1994, s16(3) – Proposed Audit Report Management of Major Road Projects.

VicRoads acknowledges the effort of those involved in the review to articulate their requirements and findings as well as giving adequate opportunities for us to review and comment on the draft report. There has been a genuine attempt to assist in identifying areas for potential improvement while acknowledging current performance.

Specific comments on the recommendations are stated below:

Recommendation 1 and 2

VicRoads agrees that consideration should be given to the impacts of induced traffic for all major projects and will review the approaches used in the UK and NZ as well as other jurisdictions. All Australian road authorities use the same approach to traffic estimation and modelling which contributes significantly to consistency in submissions to the Federal Government for road project funding. Any changes proposed in Victoria will be put forward to Austroads in an attempt to maintain this consistency.

Recommendation 4

As acknowledged in the report, this is a mandatory requirement under current project management procedures however a more consistent approach with timely documentation would be beneficial. Where appropriate VicRoads has also shared lessons learned on projects with other areas within Government and the broader industry. An example of this is that a comprehensive lessons learned document was produced for the Middleborough Road Project due to its unique construction technique. This was shared with Government Departments and the industry in general.

Recommendation 5

As acknowledged, measurement of project outcomes has been done for several years, however a more consistent and project specific approach needs to be taken with improved documentation. VicRoads is developing its project outcomes framework which will apply to future projects.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Gary Liddle', written over a horizontal line.

**GARY LIDDLE
CHIEF EXECUTIVE**

25/5/2011



VicRoads ABN 61 760 960 480

RESPONSE provided by the Chairman, Linking Melbourne Authority



LMA reference: A221148

Your reference: 25946/01

25 May 2011

Mr D D R Pearson
Auditor General
Level 24
35 Collins Street
MELBOURNE VIC 3000

Dear Mr Pearson

Audit Report - Management of Major Road Projects

I refer to your audit report and covering letter dated 12 May 2011.

This letter responds to the major issues raised in the Linking Melbourne Authority (LMA) section of the report.

Value for Money

LMA remains confident that the procurement represents Value for Money for the State.

The criticisms raised in the report regarding assumed costs relate only to the timing of changes to assumptions that occurred during the procurement process. The assumptions were correct at the time the decision to award the contract was taken by Government, and the audit report does not suggest otherwise.

As regards the assumed benefits, determined using the traffic modelling undertaken during the planning stage, LMA disagrees with VAGO's assertions about the application of the approved guidance material available at the time. LMA's contractors followed the approved guidance in their calculations, and LMA has on file a series of January 2008 emails from Department of Infrastructure (which has responsibility for overseeing traffic modelling in Victoria) confirming in-principle approval of the calibration and validation processes and future year matrices used by LMA's consultants.

We also need to point out that the 2008 Guidance Material referred to in the audit report was published well after the modelling was completed.

Discount Rates

There are two issues regarding discount rates.

The level of sensitivity analysis

LMA followed the newly released (and previously untested) guidance material provided by Infrastructure Australia on this topic. LMA was advised in this work by industry leaders PricewaterhouseCoopers. In addition, the



RESPONSE provided by the Chairman, Linking Melbourne Authority – continued

Department of Treasury and Finance (DTF) *Partnerships Victoria* unit was closely involved with the extensive discount rate analysis, both through a secondee to our Project Team, and through its senior representative being on the Project's evaluation panel. This senior representative was one of the authors of the Infrastructure Australia guidance.

The sensitivity testing in the initial evaluation report fully complied with the requirements of the guidance material and was accompanied by a detailed 16 page 'Discount Rate Amendment Paper' to ensure that appropriate rates were applied. Further, as a final review, Ernst and Young prepared an independent report on the discount rate derived for the Project, which ultimately led to DTF instructing LMA which rate to use in the final assessment. Given the level of rigour that had gone into the process, that the requirement to sensitivity test the final rate was fully addressed by the initial sensitivity testing (as it remained within the range of that initial testing), and that DTF ultimately instructed LMA which rate to use, there was no useful purpose in representing the sensitivity testing in the supplementary evaluation report.

Conveying discount rate sensitivity to the decision makers

The extent of sensitivity testing and DTF's involvement (as a key decision maker in this respect) is described above. The Board of LMA is completely happy with the disclosure of the material in making its decision. While the final rate was adjusted after the formal board meeting dealing with the recommendation of the preferred bidder, the outcome (which was marginal and enhanced the recommended proponent's position relative to its competitor), was conveyed in writing to the Chief Operating Officer and the Chief Executive Officer. The latter discussed it with me, and I judged it unnecessary to formalise it with the other Board members after alerting the Minister to the situation.

The revised rate formed the basis of the presentation to the Cabinet Committee on 14 January 2010 which led to the appointment of the recommended bidder. Based on the detailed involvement of DTF's *Partnerships Victoria* unit, LMA understands that DTF separately briefed the Treasurer on all matters including discount rates.

Linking Melbourne Authority welcomes your independent review of its processes in relation to the procurement of contractors for the ground breaking delivery of the Peninsula Link project as Australia's first 'Availability Model' PPP road project and will institute changes to our procedures where deemed appropriate in line with the conclusions and recommendations.

Please contact Ken Mathers or Ian McLennan on 8562 6800 if you require further information and quote the above Linking Melbourne Authority reference on related correspondence.

Yours sincerely


David Buckingham
Chairman

Auditor-General's response to Linking Melbourne Authority

Value-for-money—reliability of the economic benefits

Page 20 of the report explains that LMA's approach was assessed against Department of Transport guidelines dating back to 2005.

Discount rates—the level of sensitivity analysis

Page 28 of the report explains why LMA should have repeated the sensitivity testing when the discount rate was amended from 9.28 per cent to 8.69 per cent.

Discount rates—conveying discount rate sensitivity to the decision-makers

Page 28 paragraph five of the report states that we found no documentation informing decision-makers about the final discount rate sensitivities.



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| Report title | Date tabled |
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