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State Investment in Major Events

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Victorian Auditor-General's Office

Auditing in the Public Interest

The Hon. Robert Smith MLC
President
Legislative Council
Parliament House
Melbourne

The Hon. Jenny Lindell MP
Speaker
Legislative Assembly
Parliament House
Melbourne

Dear Presiding Officers

Under the provisions of section 16AB of the *Audit Act 1994*, I transmit my report on *State Investment in Major Events.*

Yours faithfully

DDR PEARSON
Auditor-General

23 May 2007

Foreword

Securing, creating, staging and then retaining major events is a global, highly competitive business. Since the 1990s, Victoria has been successfully attracting a range of major events in areas as diverse as sport, culture and fashion. They include the Australian Formula 1 Grand Prix, the 2006 Commonwealth Games, the Melbourne Winter Masterpieces, the Melbourne Food and Wine Festival and the Melbourne Fashion Festival.

The government continues to make a substantial investment in major events. In 2006-07, it increased its appropriation by $50.4 million over 4 years and the 2007-08 Budget provides an additional $34.2 million from 2007-08 through to 2010-11.

Against this background, audit has concluded that major events undoubtedly add economic value for Victoria. Importantly, there are also social and community benefits from participation both in the events themselves and in their related off-site events, such as street parades.

Although the audit has identified areas for improvement, such as having a more analytical and evidence-based justification for the level of government funding requested, it confirmed that a sound framework for the management of major events has been established. In particular, agency management of funding arrangements with events organisers has been of a high order.

A further objective of this audit was to examine how the economic value of major events is assessed. Specific attention was given to the 2005 Australian Formula 1 Grand Prix, and in this regard, 2 independent studies were commissioned. It is acknowledged that economic assessment models are not an exact science. Different assumptions lead inevitably to different conclusions about economic benefit.

Nevertheless, the key message from audit's examination is that evaluation models should be rigorous and transparent. This means that assumptions made in any economic evaluation of major events should be clearly stated and that the economic assessment models should reflect contemporary developments in economic analysis. The commissioned studies make an important contribution to what should be a continuing debate about the efficacy of the economic methodologies currently used.

Ultimately, government will be best placed to take decisions on financially supporting major events only when it has the most reliable and comprehensive information at its disposal. To that end, this audit makes out a powerful case that the economic assessment models currently used now warrant concerted re-evaluation and further development.

DDR PEARSON
Auditor-General

23 May 2007

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1 Executive summary

1.1 Introduction

Since the 1990s, the Victorian Government has supported major events to attract tourists from interstate and overseas to increase Melbourne and Victoria's international profile and benefit the state. This was recently reaffirmed by the government with the launch its 10 Year Tourism and Events Industry Strategy in October 2006.

Victoria has successfully attracted a wide range of major events in areas covering sport, culture and fashion. These include the Australian Formula 1 Grand Prix, the 2006 Commonwealth Games, the 2007 FINA World Swimming Championships and the World Superbike Championships, the Melbourne Winter Masterpieces (e.g. the Impressionists exhibition), the Melbourne Food and Wine Festival, the Melbourne International Jazz Festival and the Melbourne Fashion Festival.

In the 2006-07 Budget, the government announced that there would be an additional $50.4 million over 4 years for major events. This increased the funding for major events to approximately $55 million per annum plus consumer price index increases over the period. The 2007-08 Budget provided an additional $34.2 million from 2007-08 to 2010-11.

There are 3 major phases to the major events management cycle. These are:

- **Pre-event assessment**. The Victorian Major Events Company (VMEC) conducts preparatory research and lobbying for potential events. A submission is prepared by VMEC to seek approval from the Major Events Cabinet Committee (MECC) to fund an event.
- **Funding management**. Once funding has been approved, relevant government agencies contract manage events in accordance with agreements reached between the government and event organisers. This involves, among other things, ensuring payments made to event organisers are consistent with agreements.
- **Post-event assessment**. At the conclusion of an event, a post-event economic assessment is commissioned by the agency responsible for the event.

The audit examined these phases of the major events management cycle.

1.2 Findings

Major events have undoubtedly delivered economic value to Victoria. Given that some major events have now been run for more than a decade, this audit provides an opportunity to consolidate areas of strength, and to focus on areas where further attention is needed.

In terms of the major events management cycle, the audit found that the pre-event guidelines are consistent with other states and provide a sound foundation for assessing major event proposals. Some further refinements were needed to demonstrate the extent of net benefits to Victoria. The management by agencies of funding arrangements with event organisers was well managed. Post-event assessments can be upgraded through the use of more comprehensive methodologies and, where practicable, using a triple bottom line approach to embrace the emerging importance of social and environmental impacts in addition to economic impacts.

In this context, the key findings were:

- The framework for the assessment and approval of major events was generally sound.
- The preparation of the pre-event assessments submitted for funding approval could be improved by:
  - providing additional information and analysis to justify that the level of funding sought is commensurate with the likely net benefits to be derived by Victoria
  - demonstrating that significant risks to government have been identified and assessed and providing an assessment on the level of reliance that can be placed on strategies to manage these risks.
- Additional empirical research studies on the impact of major events may be needed to provide MECC with further sources of reliable information to better inform funding decisions.
- The approach currently taken by agencies when conducting post-event assessments did not directly address costs and benefits.
- Agencies should be introducing more comprehensive methodologies, which better reflect how the economy works, when assessing the economic value of the more significant major events.
- There is scope for greater transparency in economic assessments, particularly with regard to:
  - the workings of economic models and the basis for assumptions used
  - the safeguards over the reliability of data collected from surveys of attendees at major events.
- There is scope to broaden the post-event assessment focus beyond the economic to embrace important considerations such as:
  - social and environmental impacts
  - the degree to which risks were effectively managed
  - opportunities to introduce further improvements to future events.

1.3 Recommendations

Pre-event assessment

1.1 That the Major Event Assessment Statement (MEAS) be revised to ensure there is more evidence-based justification for the recommended level of funding relative to the projected net benefits to Victorians.

1.2 That VMEC, in conjunction with agencies responsible for particular major events, identifies major gaps in information critical to MECC's deliberations on funding major events and develops cost effective strategies to address critical information shortfalls.

1.3 That the MEAS places more emphasis on assessing significant potential risks and the likely effectiveness of the risk treatment strategies proposed.

Post-event evaluation

1.4 That economic impact assessment reports become more rigorous and transparent in terms of the:

- economic models used to estimate economic effects such as changes to the Gross State Product and employment
- the rationale for key assumptions that have a material effect on the level of economic impacts.

1.5 In order for government to be more comprehensively apprised of the full range of major event impacts, post-event assessments should be broadened to take, where practicable, a triple bottom line approach embracing not only economic but social and environmental factors.

1.6 That post-event assessments address the effectiveness of risk management and continuous improvement arrangements.

1.7 That VMEC provides MECC with a reconciliation between the pre-event assessments and post-event results.

1.8 That guidelines be developed by the Department of Treasury and Finance (DTF), in consultation with relevant agencies and VMEC, for the economic assessment of major events based on the size of government funding and the expected effects on the economy. Consideration should be given to:

- the use of cost benefit analysis at the pre-event stage for all events to determine the degree to which anticipated net benefits match the funding sought
- an updating of the pre-event cost benefit analysis at the post-event stage
- for smaller events, the reporting at the post-event stage should be against a suite of key performance indicators such as expenditure by interstate and international visitors directly attributable to the event
- investing in the use of computable general equilibrium modelling for larger events at the post-event stage to assess their impact on the economy.

1.9 That a lead agency be nominated to work in consultation with key agencies and VMEC to establish a program to progressively implement, as practicable, the assessment of social and environmental impacts of major events.

Contractual and management arrangements

1.10 That contractual agreements include a requirement for organisers to:

- submit to the responsible agency a risk management strategy prior to the event's commencement
- undertake a continuous improvement process involving representatives of key stakeholders such as event organisers, government agencies, peak bodies and the community.

1.11 That agencies, in consultation with DTF and VMEC, establish a panel of preferred contractors to undertake major economic assessments.

Public reporting of outcomes

1.12 That a reporting template be developed to facilitate the public reporting of key outcomes from major events to increase transparency and accountability for the use of public funds.

RESPONSE provided by the Secretary, Department of Treasury and Finance

Recommendation 1.8

DTF supports the preparation of guidelines to assist in the economic assessment of major events.

Recommendation 1.11

DTF will consult with VMEC and relevant agencies on the selection of preferred contractors to undertake major economic assessments.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

The Auditor-General's overall conclusion that "major events have undoubtedly delivered economic value to Victoria" reaffirms the strategic importance of major events to this State. Victoria is home to many of Australia's annual major sporting and cultural experiences, such as the Australian Formula One Grand Prix, AFL Grand Final, Melbourne Comedy Festival, Melbourne Food and Wine Festival, Melbourne Winter Masterpieces and the Australian Open Tennis Championships. Collectively, these and other smaller events contribute to the attraction of tourists from interstate and overseas, increase Melbourne and Victoria's international profile through media exposure and destination branding, and expands opportunities for industry development through increased trade and investment opportunities.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development - continued

The Auditor-General has made a welcomed contribution to the State's overall management of major events. The importance of consistent, comprehensive and robust data for decision making, evaluation and reporting is acknowledged, and is subject to continuous improvement processes similar to those undertaken across the full range of government activity. As part of this process, and independent of the Auditor-General's observations, the Department of Innovation, Industry and Regional Development will commence in conjunction with the Departments of Treasury and Finance and Premier and Cabinet to review and implement a program of evaluation for major events falling due for renewed funding in 2007-08.

With respect to economic modelling to estimate potential economic benefits, and to measure actual benefits following the hosting of a major event, care needs to be taken to recognize that each methodology and model type has its own particular strengths and weaknesses. Economic modelling is not a precise science and relies on assumptions and linkages made by the model builder. Accordingly, whilst account will be taken of the arguments made by the Auditor-General on the veracity of his preferred approaches, the models adopted for ongoing use need to be identified on the basis of their suitability for events that are generally relatively small in scale and cost. Judgment will be exercised in selecting models to ensure consistently reliable and timely analysis.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

The Victorian Major Events Company (VMEC) welcomes the Auditor-General's overall conclusion that "major events have undoubtedly delivered economic value to Victoria", which reaffirms the importance of the major events strategy to Victoria.

Fifteen years ago, the State Government established VMEC, to attract tourism to Victoria, raise Melbourne's international profile, and instill community pride. Major events are as important to Victoria and Melbourne, as the Barrier Reef is to Queensland and the Opera House is to Sydney. Major events are Victoria's competitive advantage.

It is fact that Victoria leads the world in attracting and staging international events. Its performance has been independently recognised by the event industry, governments and leading publications, such as:

- *"Melbourne is the most successful international sporting city, both in bidding for and hosting major events" – international consulting and research firm, ArkSports UK*

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company - continued

- *"There is one city which is held up as a case study for attracting major events … Melbourne has written the book which others follow." – Highly regarded international industry publication, Sport Business International*
- *"VMEC is recognized as a best practice model nationally and globally and its success, innovation and leadership have helped position Melbourne and Victoria as a world leader in events". – TTF Australia CEO Christopher Brown on announcing VMEC being awarded the 2006 TTF Corporate Leadership Award (national peak body for the tourism sectors).*

Victoria's major events success is envied the world over, with a number of event procurement organisations including Scotland, Spain and the UK having been modeled on VMEC. NSW recently announced a total review of its operations in the area of Major Events after failing to match Melbourne's success. Their media release declared that the review will deliver "a Major Events Corporation, based on the successful Victorian model, with a remit to aggressively target major projects".

Melbourne and Victoria have created a global reputation for a world class events calendar. Victoria is home to many of Australia's annual major sporting and cultural experiences, such as the Australian Formula One Grand Prix, Melbourne Comedy Festival, Melbourne Food and Wine and Fashion Festivals, Melbourne Winter Masterpieces and the Australian Open Tennis Championships. A key strategy underpinning the success of Victoria's events calendar is a diverse and flexible approach which delivers a suite of events bringing a wide range of benefits to the State, including:

- *Significant economic impact benefits from interstate and international tourists*
- *International media and branding exposure*
- *Use of sporting and cultural venues and infrastructure*
- *Industry development through expanded trade and investment opportunities*
- *Sport and youth development*
- *Community engagement, social and cultural benefits.*

The Auditor-General's report acknowledges the central place of the Strategic Framework for Approval of Major Events developed by the State Government in 2000, which established detailed criteria for the assessment of major events by VMEC and MECC. However, destination branding and media exposure, one of the most fundamental outcomes a host city seeks in securing major events, and a key element of the Strategic Framework, has not been addressed.

FURTHER comment by the Auditor-General

This issue of branding and media exposure has been addressed, however, due to the absence of quantitative evidence, no value has been factored into the economic assessments.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company - continued

Destination branding through events is a powerful and proven tool to create greater awareness and visitation for a destination and hence provide economic benefits to the host city. Brand analysis and research reports indicate that destination branding opportunities offered by major events can be most effectively leveraged as part of a broader tourism leveraging strategy. VMEC and the State Government, through agencies such as Tourism Victoria, has adopted a sophisticated approach to ensure the development of brand awareness and cross-leveraging strategies to maximise the potential return from major events. The effectiveness of this Strategy is reflected in Victoria's 42 per cent share of all international event visitations to Australia, bringing millions of dollars into the State each year.

VMEC notes the Report's comments regarding the various economic models for assessing the benefits of major events. Different economic benefit models in use around the world each have their own strengths and weaknesses and as such have their share of proponents and detractors.

The decision on which methodology to use to evaluate an event should take into account factors such as the objective of the valuation (e.g. Cost Benefit Analysis (CBA) provides advice on investment options, whereas Input-Output (IO) and Computer Generated Equilibrium (CGE) models provide information on the impact of the event on the broader economy), the scale of the event, the quality of the impact data, the time and resources constraints, and the cost of the evaluation.

VMEC will work towards to develop of an industry-relevant national model. It will be valuable to consult with other Australian States and the event sector before adopting the most appropriate economic impact assessment mode for each type of event.

The Auditor-General's report provides valuable information in the assessment and valuation of major event. This report will be provide helpful additional research particularly on the topic of economic impact assessments of major events.

RESPONSE provided by the Chief Executive Officer, Australian Grand Prix Corporation

The Australian Grand Prix Corporation (AGPC) has reviewed this report with great interest and thanks the Auditor-General for the opportunity to comment on the report.

AGPC is charged with the responsibility of undertaking and facilitating the organisation, conduct, management and promotion of the Formula One event held annually in Albert Park. Each year, AGPC delivers what is widely regarded as the best Grand Prix on the international Formula One calendar in a financially responsible manner which is consistent with the parameters set by the Victorian Government. We note that the Auditor-General audits AGPC's accounts on an annual basis and that he has consistently found that AGPC complies with all relevant financial reporting requirements. We further note that the Auditor-General acknowledges the contribution that major events such as the Grand Prix make to Victoria's economic prosperity.

As demonstrated by the report, there are many ways to measure the economic benefit derived from major events. There are positives and negatives associated with each economic model and given that each model has its own underlying assumptions, widely differing results are achieved depending on the model used. The National Institute of Economic and Industry Research (NIEIR) was selected prior to the first Grand Prix in Melbourne to perform an economic benefit assessment of the event, following a competitive tender process conducted by the previous State Government in conjunction with AGPC. The input output model was selected by NIEIR as the most appropriate economic model and has been used to assess the economic benefit of the 1996, 2000 and 2005 Grands Prix. This has allowed a comparison of results between these Grands Prix as well as comparisons with other major event such as the Australian Open Tennis and the Air Show which have also used NIEIR to assess economic benefit.

The most appropriate means of evaluating economic benefit is largely a debate for economists and AGPC does not propose to enter into this complex debate. This is especially so given that the undertaking of economic assessments appears to be an inexact science where even the experts disagree. AGPC does not itself have expertise in assessing the economic benefit of major events and does not make decisions in relation to the methodology employed to make these assessments. Reputable independent experts have been engaged by AGPC and the Victorian Government to make such assessments in the past. AGPC will continue to seek advice from Government before undertaking any future studies of this kind.

RESPONSE provided by the Chief Executive Officer, Australian Grand Prix Corporation - continued

AGPC does note, however, the Auditor-General's comments that the robustness of the assessment approaches are dependent upon the quality of the data and the underlying assumptions and theoretical basis of the modelling. The Auditor-General has also stated that the expertise required to carry out the computable general equilibrium (VGE) modelling recommended in its report is not widely available within Australia.

Given these limitations, AGPC has raised questions with the Auditor-General as to the quality and/or relevance of some of the data and the assumptions made in relation to both the cost benefit and CGE analysis contained in the report. In particular AGPC notes that in his report, the Auditor-General has been prepared to estimate costs that are inherently difficult to estimate such as noise, traffic congestion and loss of park use and amenity.

The Auditor-General has not, however, been willing to put a figure on important benefits of the Grand Prix such as brand exposure and promotional benefits, national and international publicity and media coverage, reputation reinforcement, civic pride, the attraction of business investment, and the promotion of Melbourne and Victoria as a tourist destination and as a place to do business. For these reasons, the analysis in the report and the figures produced must be considered in light of the fact that there are significant benefits that have not been or have not been able to be quantified. The report therefore does not provide a complete picture as to the benefits of the Grand Prix.

In addition, the final outcome of any economic assessment is heavily reliant on the base data used and in this case such data has come from a range of sources. AGPC acknowledges that the Auditor-General was limited in his ability to collect new data for the purpose of the cost benefit analysis conducted in this report. As a result the Auditor-General had to rely in particular on data which was collected by the ACT Auditor-General in his review of the V8 car races held in Canberra in 2000 (the V8 data). Given the significant differences between the Canberra V8 race, for example in terms of pricing and demographics, and that the V8 data is now 7 years old, AGPC questions the validity of using this data in a cost benefit analysis on the Grand Prix. If a cost benefit analysis is to be used to assess future Grands Prix, then to obtain a complete picture, information specially related to the Grand Prix should be used for the purposes of the analysis.

FURTHER comment by the Auditor-General

For the purposes of consumer surplus benefits (the difference between what people are willing to pay and what they actually pay), the use of V8 car races data was seen as valid. Both the 2000 Canberra V8 car races and the 2005 Formula 1 Grand Prix have related policies to maximise revenue and to identify classes of customers by their willingness to pay and to charge accordingly. This limits the extent of consumer surplus.

RESPONSE provided by the Secretary, Department of Premier and Cabinet

The Department of Premier and Cabinet (DPC) welcomes this Audit. It's conclusions, that "major events have undoubtedly delivered economic value to Victoria" and that the Government's decision making framework is "generally sound" provide a clear endorsement for the direction of major events policy in Victoria. The report also provides a considered analysis and makes a set of useful recommendations with respect to the improvement of the pre-event, contract management and post-event assessment stages of the major event selection and management cycles. These recommendations will now be given careful consideration.

The discussion on the merits of various assessment techniques, as contained in Section 6.2, is useful for the purposes of considering the Government's current approach to pre-bid and post-event assessment. It is DPC's view, however, that in further considering the type of economic assessment techniques to be used for major events in future, a degree of flexibility in the choice of tool should be maintained. This choice should take into account the size of Government's contribution to an event, the likely economic impact on an economy-wide basis and the cost to Government of each tool.

It should also be reinforced that major events deliver many benefits to Victoria that cannot be captured by economic assessment tools. Economic benefit is only one of a number of criteria for assessing major events. Further, there is a high degree of subjectivity in the assumptions that underpin the workings of economic models, which fundamentally explains why alternative assessments can produce quite different results.

The use of the CBA and CGE methodologies in assessing the 2005 Grand Prix is a good illustration of this as these tools really only provide an alternative estimate of economic value based on a particular set of assumptions and using particular assessment techniques. DPC has a number of specific concerns about these assessments that are raised in our comments contained at the conclusion of the commissioned studies.

2 Major events

2.1 Introduction

Since the 1990s, the Victorian Government has supported major events such as large-scale high profile sports and cultural events to enhance Victoria's competitiveness for the tourist dollar and to generate significant economic, social and cultural benefits to the state. The Victorian Government released its *10 Year Tourism and Events Industry Strategy,* in October 2006 which continues the government's commitment to acquiring, creating, staging, managing and retaining major events.

The major events strategy has been successful in a diverse range of events. These include:

- sporting events such as the Formula 1 Grand Prix, the 2006 Commonwealth Games and the 2007 FINA World Swimming Championships
- cultural events such as the Melbourne Winter Masterpieces featuring such exhibitions as the Impressionists
- regional events such as the Rip Curl Surf Classic at Torquay
- entertainment events such as Melbourne International Jazz Festival
- culinary and lifestyle events such as the Melbourne Food and Wine Festival
- fashion events such as the Melbourne Fashion Festival.

As well as increasing Melbourne and Victoria's international profile, major events provide economic benefits to the state.

2.2 Funding of major events

There are major events funded from agency budgets however this audit has concentrated on major events funded via the major events cap. The cap was established in 2000 to provide government funding for existing events and to secure new major events. The cap represents what the government is prepared to spend to in the current circumstances and environment. DTF have advised that the cost of winning events is increasing rapidly. Additional funding of $50.4 million was provided in the 2006-07 Budget for the next 4 years. This increased the funding for major events to approximately $55 million per annum plus consumer price index increases over the period. The 2007-08 State Budget provided for an additional $34.2 million for the major events cap between 2007-08 and 2010-11.

Sporting events dominate, with the majority of funding provided to the Australian Formula 1 and MotoGP and the 2007 FINA World Swimming Championships.

2.3 Government management arrangements

A sub-committee of Cabinet (the Major Events Cabinet Committee or MECC) decides whether to fund an event from the major events cap.

2.3.1 Key agencies involved

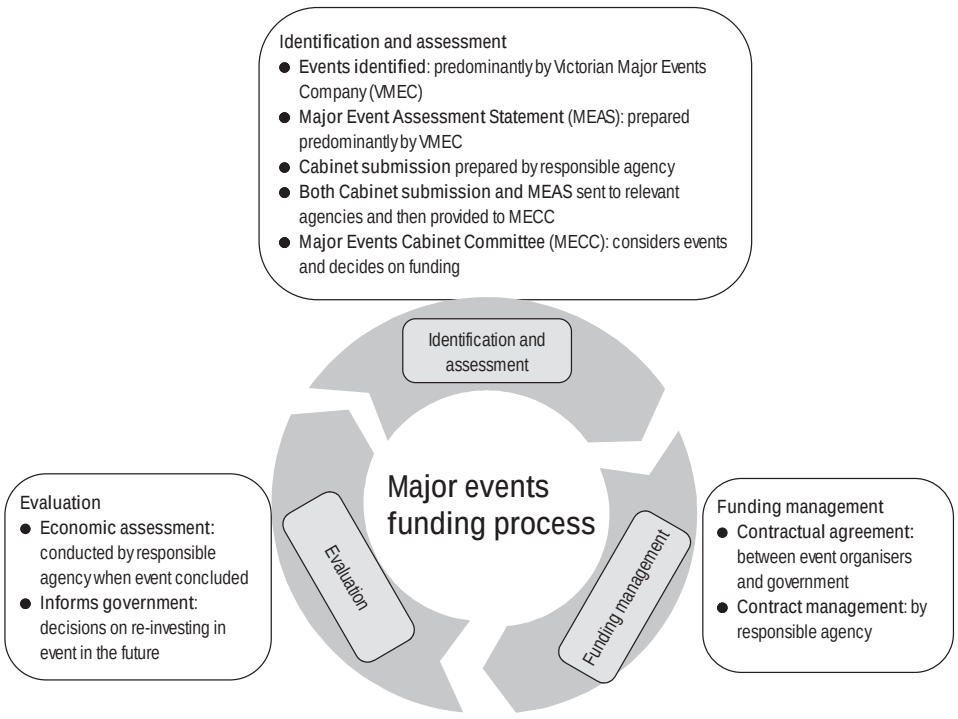
In 1991, the Melbourne Major Events Company (now know as the Victorian Major Events Company (VMEC)) was formed by the Victorian Government as a not-for-profit company fully funded by the government to identify and pursue major events that are seen to bring economic, broadcast/media exposure, cultural and social benefits to Victoria. VMEC also acts as a link between other organisations that are critical in attracting, securing and staging major events. These organisations include:

- Tourism Victoria, which is responsible for developing and marketing Victoria as a tourism destination for Australian and overseas travellers
- The Department of Innovation, Industry and Regional Development (DIIRD), which provides strategic advice to government ministers about business issues associated with the attraction and funding of major events. DIIRD works with other agencies to maximise economic and industry benefits for Victorian businesses from major events
- The Sport and Recreation Division of the Department for Victorian Communities (DVC) which contract manages major sporting and recreation events and projects
- The Australian Grand Prix Corporation, which conducts, promotes and manages the Australian Formula 1 Grand Prix and MotoGP
- Arts Victoria, which coordinates and manages major cultural events which include exhibitions from the world's leading galleries, museums and libraries.

2.3.2 Major event funding cycle

The government strategy document, *The Strategic Framework for the Approval of Major Events*, establishes the process to be followed for funding major events. This is outlined in Figure 2A.

Figure 2A
Major events funding process



Source: Victorian Auditor-General's Office.

In summary there are three broad phases to the funding process:

Identification and assessment

- The Victorian Major Events Company (VMEC) identifies, pursues and bids for major events that are likely to bring economic, cultural and social benefits to Victoria. It also acts as a link between other organisations that are important to the attracting and staging of major events, including DVC and DIIRD as well as Tourism Victoria and Arts Victoria.
- Agencies (predominantly VMEC) scan and put in bids for preferred events.
- Agencies (predominantly VMEC), in consultation with the relevant agency, prepare a Major Event Assessment Statement (MEAS) which is forwarded to the responsible agency.
- The agency responsible for the event prepares a cabinet submission for their minister as a covering document for the MEAS. The cabinet submission and the MEAS are circulated to all relevant agencies to brief their respective Ministers.
- Both the Cabinet submission and the MEAS are provided to MECC.
- VMEC provides a detailed verbal presentation on each event to MECC.
- MECC decides whether to fund an event from the major events cap.

Funding Management

- If the event is approved, the responsible agency contract manages arrangements with event organisers including ensuring payments are only made to organisers if payment deliverables are met.

Evaluation

- The responsible agency is required to organise an evaluation of the event which will be used to inform decisions on whether to reinvest in the event or similar events in the future. The evaluation includes an assessment of the economic impact of the event. VMEC also undertakes a post-event assessment presentation to MECC which is discussed with the responsible agency prior to presentation.

3 Audit scope and approach

3.1 Rationale for audit

The state's investment in major events is substantial. Decisions about whether or not to invest in major events therefore need to be informed by systematic and rigorous analysis. Appropriate mechanisms are also required to ensure that funding is managed effectively to account for costs incurred and to assess the economic value and broader community benefits generated from the public funds invested.

The audit therefore sought to provide independent assurance to Parliament and the community on the robustness of the pre-event and post-event assessment processes.

3.2 Audit objectives

The audit had the following specific objectives:

- To examine:
  - the soundness of pre-event assessments leading to the recommendation to financially support a major event
  - the management of funding agreements and contractual requirements with major event organisers
  - the post-event evaluations of the economic value derived from major events; and, specifically:
- To provide independent assessments of the level of economic value derived by Victoria from the 2005 Australian Formula 1 Grand Prix.

3.3 Audit assistance

The following contractors undertook key aspects of the audit under the overall direction of the Victorian Auditor General's Office:

- Dr Frank Harman (Harwest Pty Ltd) who was a member of the steering committee and principal economic adviser to the Office's audit team
- Professor Harry Clarke (Head of Department of Economics and Finance, Latrobe University) and Professor Leo Jago (Deputy CEO and Director of Research, Sustainable Tourism CRC, Victoria University) who formed the technical advisory group. This group provided a quality assurance role over the work of the other contractors and the audit team including the preparation of this report. Professor Jago also advised on tourism-related aspects of this audit
- Applied Economics which conducted the cost benefit analysis of the 2005 Formula 1 Grand Prix
- The Allen Consulting Group which conducted the computable general equilibrium modelling involving the 2005 Australian Formula 1 Grand Prix.

4 Pre-event assessment

At a glance

Background

The *Strategic Framework for the Approval of Major Events*, among other things, requires the preparation of a Major Events Assessment Statement (MEAS) as the basis for a request for financial support of a major event.

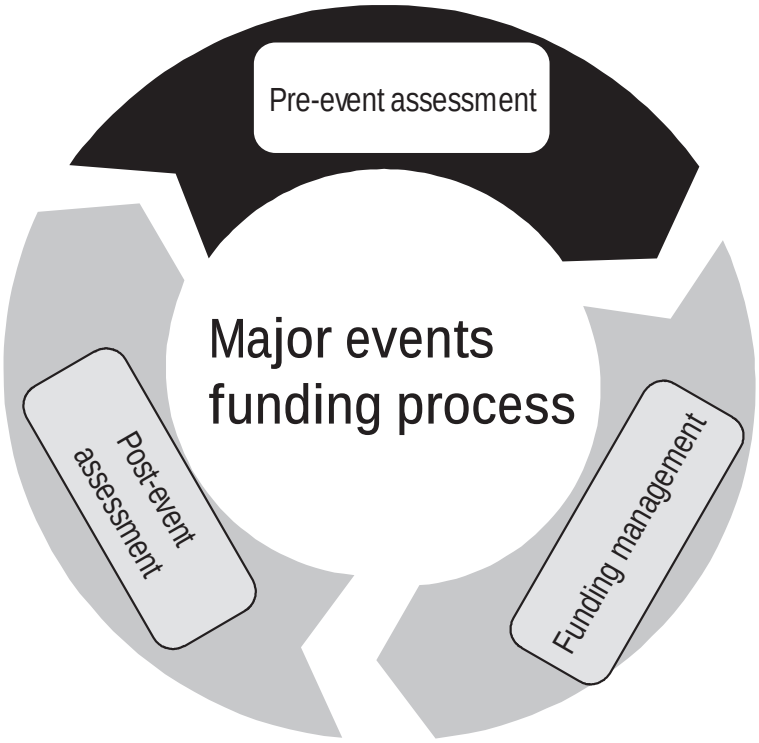
Key findings

- The strategic framework provides a sound basis for the Major Events Cabinet Committee (MECC) to consider funding proposals with the information required in the MEAS considered to be comprehensive and broadly in line with that required in other jurisdictions.
- There is however scope to enhance the overall framework and the preparation of MEASs through:
  - a more analytical and evidence-based approach to justify the level of funding requested relative to the net benefits anticipated.
  - giving greater attention to the assessment of the significance of risks and the likely effectiveness of strategies to mitigate these risks.
  - further empirical research studies on the impacts of major events to better inform MECC in its funding deliberations.

Key recommendations

4.1 That the MEAS be revised to ensure there is more evidence-based justification for the recommended level of funding relative to the projected net benefits to Victorians.

4.2 That the Victorian Major Events Company, in conjunction with agencies responsible for particular major events, identifies major gaps in information critical to MECC's deliberations on funding major events and develops cost effective strategies to address critical information shortfalls.



Source: Victorian Auditor-General's Office.

4.1 Process for the assessment of major events

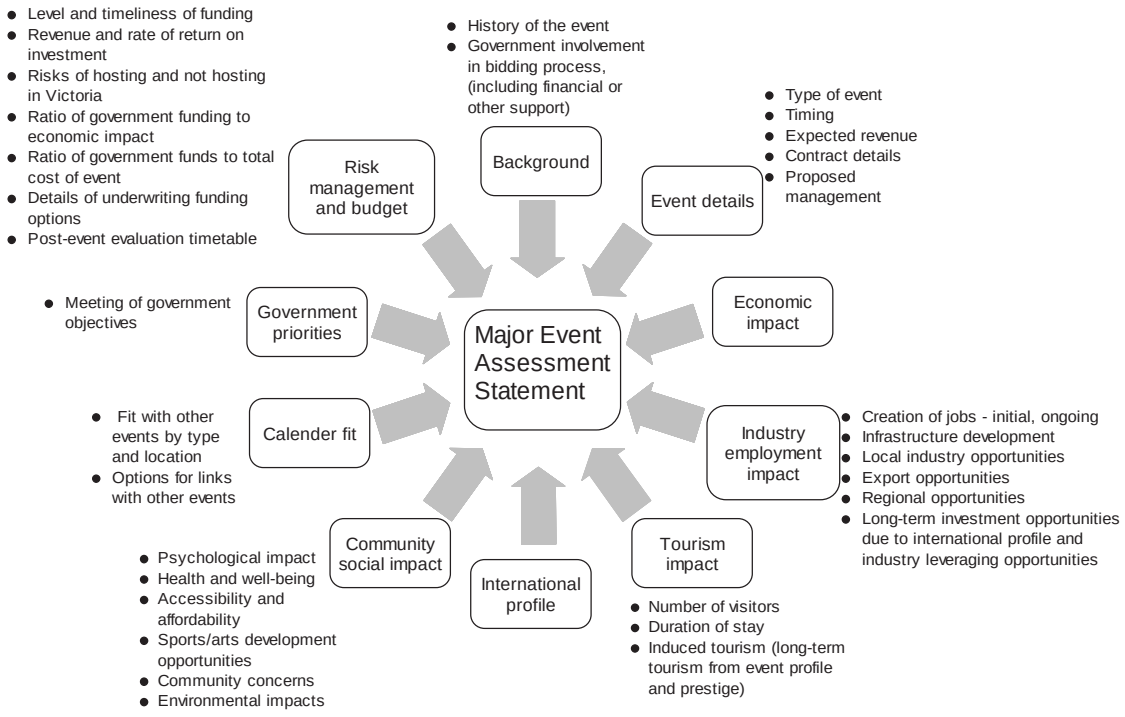
The government strategy document, *The Strategic Framework for the Approval of Major Events* (Framework), was presented to the Major Events Cabinet Committee (MECC) by the Minister for Major Projects and Tourism and endorsed on 26 October 2000.

4.2 The Major Events Assessment Statement

The Framework requires funding proposals to include a Major Event Assessment Statement (MEAS) to enable MECC to determine the merits of funding or supporting a major event proposal.

The MEAS describes the estimated impacts the event will have under a number of categories (See Figure 4A).

Figure 4A
Major Events Assessment Statement



Source: Victorian Auditor-General's Office.

The MEAS requires similar information to major event funding criteria developed by other government jurisdictions[1]. The information required is comprehensive and provides a sound basis for pre-event decision-making.

In effect, the preparation of the MEAS should enable MECC to assess all proposals in their entirety and on a consistent basis. Optimally, a MEAS should therefore:

- provide a rigorous assessment of an event across the range of specified areas including economic, social and environmental aspects
- include an analysis of the significance of identified risks and proposed risk mitigation strategies
- identify the benefits to Victoria commensurate with the funding sought.

As shown in Figure 4A, the MEAS requires information about 10 key areas upon which staging the event may impact. A total of 37 sub-criteria are required which add further dimensions to the key areas.

The following pre-event assessments (MEAS) were examined in detail by the audit:

- **Australian International Airshow 2007 – 2015** prepared by the Department of Innovation Industry and Innovation (DIIRD) in October 2002. The 2005 Airshow was approved by cabinet in 1998 before MEAS's were introduced. Therefore the audit analysed the 2007–2015 Airshow MEAS instead.
- **Melbourne Winter Masterpieces**, prepared by the Victorian Major Events Company (VMEC) in July 2003 covering events from 2004 – 2007.
- **Sail Melbourne International Regatta**, prepared by VMEC in March 2004 covering events from 2005–2008.

To confirm the extent to which observations about the MEAS for these events had broader application to other major events, the audit sample was extended to cover the MEAS for other major events including the Melbourne Food and Wine Festival. Some of these events are currently subject to commercial negotiations and are not disclosed in this report.

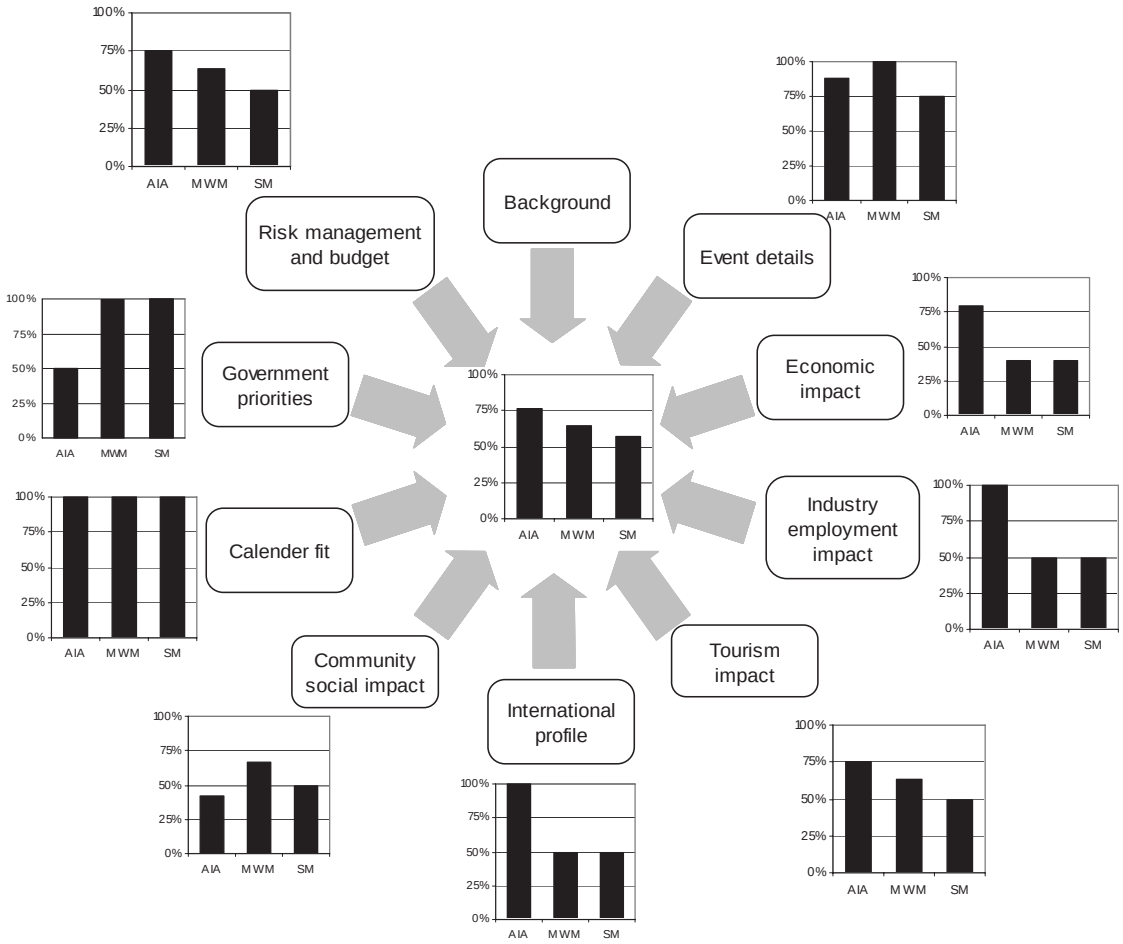
This broader coverage also enabled the development of some general comments on the content of the MEAS.

4.2.1 Information provided in Major Event Assessment Statements

Figure 4B summarises the extent of compliance with the coverage of the relevant MEAS information within categories for the 3 major events examined in detail.

[1] The audit compared the MEAS with funding criteria used by the Western Australia State Government, the New Zealand Ministry of Tourism and Sport Canada, which is a branch of the International and Intergovernmental Affairs and Sport Sector within the federal Department of Canadian Heritage.

Figure 4B
Coverage of information requirements – major events assessment statement



Legend

AIA	Australian International Airshow 2007-2012
MWM	Melbourne Winter Masterpieces
SM	Sail Melbourne International Regatta

Source: Victorian Auditor-General's Office.

Overall, the key impact areas were given satisfactory coverage in the samples of the MEAS examined by the audit with the MEAS for the Australian International Airshow in particular providing a good coverage of the required information. However, the extent to which some of the sub criteria were addressed could be improved and these are detailed below.

Economic, employment, industry and tourism impacts

In September 2004, MECC requested the Department of Treasury and Finance (DTF) to undertake an internal review of the Major Events Strategy. DTF recommended more rigorous pre- and post-assessment of events, commenting that *"all proposed major events should be required to demonstrate they are 'affordable' and that they provide a net economic benefit to Victoria"* [2] . The Framework also states that *"It is important that a major event proposal be evaluated to determine whether it would make a net contribution to the state*."

Therefore, in line with the DTF recommendation and the requirements of the Framework, audit expected that the information included in the pre-event assessment would provide a detailed justification of the level of government funding for the event which takes into account the expected effects of the broader social benefits and the estimated net benefits to Victoria. In the MEAS samples examined, this was found not to be the case.

The events examined in detail provided broad economic data about the expected impact of the event on Gross State Product. This information was largely sourced ex-post from previous economic impact assessment studies. As discussed later in this report, the robustness of the methodology employed and the reliability of some of the assumptions used in post-event economic impact assessments warrant a thorough re-evaluation.

In addition, the results of these economic impact studies can only estimate the effect on the economy. Whether an event is worth proceeding with can best be determined by calculating the event's net benefit.

Information on economic issues could have been improved in other areas. For example:

The Australian International Airshow has been run every 2 years since 1992. It sought a government contribution to extend the agreement to cover the period 2007-2015. The MEAS for the Airshow was based on the history of the event and included information about:

- revenue received by organisers
- current and likely future government funding contribution
- attendance figures
- estimated impact on Victorian Gross State Product and the Geelong Gross Regional Product
- additional interstate and international tourists.

[2] Department of Treasury and Finance briefing on Review of Major Events Strategy for Major Events Cabinet Committee meeting on 15 December 2004.

The major benefit for Victoria from the Airshow is claimed to be from the additional sales to exhibitors rather than from tourist expenditures[3]. Given the event has been run since 1992, clear evidence about sales linked to the event would have strengthened the MEAS. This is discussed in further detail in Part 6 of this report.

The *2003* Melbourne Winter Masterpieces sought funding for a first time event. It is acknowledged that it was therefore difficult to produce reliable assessments of economic, employment and tourism impacts in the MEAS. However audit noted that:

- Four economic impact studies of previous cultural events were quoted to support the funding application, the most recent from 1996. Three of the studies cited were of festivals, not art exhibitions. It was not clear how their claimed economic benefits would translate to benefits from an art exhibition.
- The event aimed to enhance tourism expenditure by promoting Melbourne as a cultural capital but how that objective was to be achieved and assessed was not addressed in the MEAS.

Melbourne Winter Masterpieces – Dutch Masters.
(Image courtesy of NGV photographic services.)

The Sail Melbourne International Regatta has been run since 1994. It sought funding over 4 years to extend the agreement to cover the period 2005-2008.

[3] National Institute of Economic and Industry Research, *Economic Evaluation of the 2005 Australian International Airshow,* a report for the Department of Innovation, Industry and Regional Development, June 2005 p.39

The MEAS commented on the importance of the event to Victorian companies in terms of their export performance, but apart from an endorsement of the event from an industry body, no direct evidence of any export effects was supplied. This evidence might have included, for example, details of case studies of companies with significant export agreements that can at least partially be linked to the event.

The audit assessment of post-event evaluations commissioned by agencies is discussed in detail later in this part of the report.

Risk management and budget

Most MEAS included an operating budget, providing a level of transparency in that the amount of funding requested was the difference between budgeted income and expenditure.

However, no operating budget was included in the MEAS for the Melbourne Food and Wine Festival and other selected events. The major justification for the request for funding for those events was the increased economic benefits for Victorians, but this did not provide a basis for determining the level of funding required.

Risk management standards suggest that a MEAS would contain an analysis of the risks associated with the event, their likelihood and potential impact together with treatment strategies to reduce or manage them[4].

The 2007-15 Airshow MEAS noted the potential for increasing risks but also pointed out the difficulties of making accurate financial projections and risk assessments so far in advance. However, the event commenced in 1992 and the MEAS also commented that there were years of solid data upon which to base projections.

The major risks identified for the Airshow included:

- poor management by organisers
- diminished participation of defence forces due to armed conflict
- major accidents at the event
- additional infrastructure requirements
- increasing cost of service provision including insurance.

Risk treatment strategies identified included:

- contingency planning by organisers to address accidents
- the use of vintage aircraft in the case of diminished participation by defence forces.

The above details are a comprehensive outline of the risks involved however the Airshow MEAS would have been further improved by analysis and assessment of:

- the significance of the extent of identified risks to the running of the event including whether the government contribution may need to be increased
- the anticipated effectiveness of some of the key strategies cited to treat these risks.

[4] Australian/ New Zealand Standard Risk Management AS/ NZS 4360:2004.

The Melbourne Winter Masterpieces MEAS identified risks however it would have been improved by further analysis of their relative significance and the likely effectiveness of proposed treatment strategies.

The Sail Melbourne MEAS stated that a number of risk scenarios had been identified by the management Committee and that a thorough risk analysis had been undertaken. No other details were provided.

4.3 Conclusions

The MEAS format is a sound basis for the assessment of major events. However, there is a need for a more analytical and evidence based approach to justify the level of government funding based on net benefits to Victorians. This will require some adjustment to the MEAS format.

A more evidence-based approach is also likely to highlight key gaps in existing data collection systems and drive enhancements to the information provided.

In addition to examples included in this part of the report, audit's commissioned analysis of the 2005 Australian Formula 1 Grand Prix commented on the lack of information on the marginal profits (business surplus) accruing to Victorian businesses from major events or tourism in general. In Part 6 of this report audit noted that the estimates of induced tourism in economic impact assessments of the Australian Formula 1 Grand Prix were based on a 1990 study if Melbourne had hosted the Olympics. These estimates were questionable. This type of information is directly relevant to the pre-event assessment stage of major events.

Consideration should be given to investing in the commissioning of targeted research on the impact of major events to better inform the funding decisions taken by MECC. Potentially, MECC might designate and approve an annual research program based on their assessed information needs.

Information contained in pre-event assessments seeking to roll over an existing event relied substantially on information sourced from post-event economic impact assessments. This is understandable given the importance of post-event assessments, however caution should be exercised when considering these results due to concerns over their robustness. This also reinforces the value of developing further sources of information.

Recommendations

4.1 That the MEAS be revised to ensure there is more evidence-based justification for the recommended level of funding relative to the projected net benefits to Victorians

4.2 That VMEC, in conjunction with agencies responsible for particular major events, identifies major gaps in information critical to MECC deliberations on funding major events and develops cost effective strategies to address critical information shortfalls.

4.3 That the MEAS places more emphasis on assessing significant potential risks and the likely effectiveness of the risk treatment strategies proposed.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 4.1 and 4.2

It is agreed that in many cases detailed pre-event evidence-based justification is difficult to obtain. As noted by the Auditor-General, assessment of major event submissions to date has been against the broad criteria outlined in the MEAS, with the information required being "comprehensive and providing a sound basis for pre-event decision-making". These criteria include economic impact, international profile, community and social impact, calendar fit, consistency with Government priorities, risk and budget. The rationale for these criteria is to provide MECC with a decision making process from which to assess requests for major event support.

The Department of Innovation, Industry and Regional Development will work with VMEC and other agencies to provide MECC with comprehensive and accurate information and to ensure that the MEAS process continues to be an effective tool for decision-makers in the context of an extremely competitive and professional global market where event owners often demand a very tight bidding process.

Recommendation 4.3

The Department of Innovation, Industry and Regional Development will work with other agencies to put in place more rigorous risk analysis similar to those required across government for business cases for funding bids of programs and projects. An appropriate level of analysis will be required, with account taken of the scale and nature of the event.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 4.1

The key findings of the Auditor-General's report confirm that the Major Event Assessment Statement (MEAS) is a comprehensive and sound evaluation tool. Developed to brief the Major Events Cabinet committee (MECC), the MEAS contains both qualitative and quantitative criteria, so as to provide rigorous and holistic advice regarding an event's potential value to Victoria. VMEC currently assesses potential events for Victoria based on the Strategic Framework for Major Events established by Government in 2000.

VMEC will work with other Government agencies to introduce any changes to the future MEAS process to ensure MECC receives cost effective and timely advice which takes account of the size and nature of the proposed event.

Recommendation 4.2

VMEC notes and supports the Auditor-General's proposition that the framework for the "assessment, approval and evaluation of major events is generally sound". VMEC has a rigorous and multi-layered approach to major event analysis, and will work with Government agencies to ensure that comprehensive and accurate information continues to be provided to the MECC.

Recommendation 4.3

VMEC assesses potential events for Victoria based on the Strategic Framework for Major Events, which includes an assessment of potential risks and the subsequent requirements of the State Government, developed through MECC. VMEC will continue to consult with relevant government Departments with respect to the assessment of potential risks.

5 Funding management

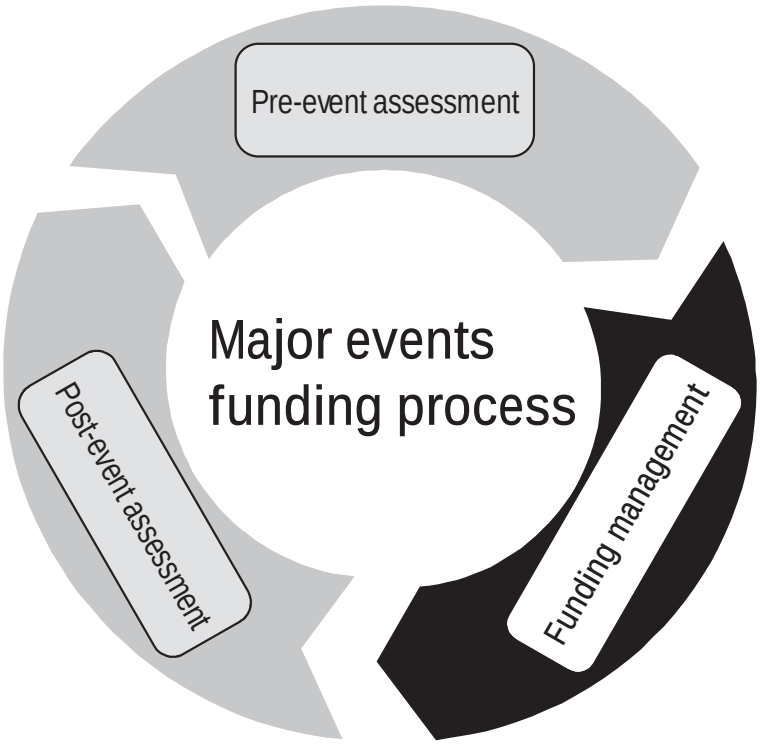
At a glance

Background

Payments are made to organisers over the course of the agreement based on the achievement of defined milestones.

Key finding

- Funding agreements with event organisers were well managed. Where conditions for funding had not been met, agencies, in their role as contract managers, quite properly deferred payment until there was compliance.



Source: Victorian Auditor-General's Office.

5.1 Management of funding arrangements with event organisers

To enable sound management of funding, contractual agreements between the government and the organisers of major events should include clearly defined payment deliverables.

Contractual arrangements for 3 major events were examined.

- ***Australian International Air Show***. In 2002, agreement was reached with Aerospace Australia Ltd. (trading under the registered name Airshows Downunder) for the staging of 5 Australian International Airshows every 2 years from 2007 to 2015.
- ***Melbourne Winter Masterpieces***. The state government established a contract with Art Exhibitions Australia (AEA) for the identification, development, staging and promotion of exhibitions in 2003. Under the agreement, AEA bears the financial risk if the exhibition makes a loss but collects 80 per cent of the admission revenue. The remaining 20 per cent goes to the venue manager, the National Gallery of Victoria regardless of the profitability of the exhibition. The audit examined the 2005 Dutch Masters as the most recent Melbourne Winter Masterpieces exhibition that had completed all relevant payment requirements.
- ***Sail Melbourne International Regatta***. In 2004 the Victorian Yachting Council was contracted to conduct the Sail Melbourne International Regatta from 2005 to 2008 covering the financial years from 2004-05 to 2007-08.

5.1.1 Compliance with conditions of funding

For the Australian International Air Show, the Department of Innovation Industry and Regional Development quite properly deferred the second payment for the 2007 event because access to Avalon airport, a key payment deliverable, was not secured by the due payment date. This issue has now been resolved and this payment and the third and fourth payments relating to the 2007 event have been made in accordance with the 2007-2015 agreement.

Most Melbourne Winter Masterpieces payment requirements involved the completion of a particular action such as the opening day of the exhibition or the commissioning of an economic impact report.

The major complexity in the payment schedule is the provision of a comprehensive report by AEA to Arts Victoria where the report is required to provide information in 8 key areas to allow the payment by Arts Victoria. While a comprehensive report was produced and most of these areas were adequately covered, in a few instances there was not strict compliance despite active follow-up from Arts Victoria.

The audit concluded that there has been substantial rather than total compliance with the agreement. In an overall sense, contract management is considered well managed, although attention in the future should be directed to ensuring complete compliance through perhaps simplifying the number of deliverables upon which payment is based.

The 2004 agreement with the Victorian Yachting Council for the organising of the 2006 Sail Melbourne event involved 3 separate payments. These payments were correctly made by the Department for Victorian Communities in accordance with the agreement.

5.1.2 Conclusion

Funding agreements covering the 3 major events under review were well managed by agencies. There was in most cases strict compliance with the funding agreements. In a small number of instances where information was not fully provided as required, this was not considered a significant weakness although it is an area for continued management attention.

6 Post-event assessment

At a glance

Background

Post-event assessments, which focus on economic aspects, are considered by the Major Events Cabinet Committee at the conclusion of an event or when considering whether to agree to roll-over an existing agreement.

Key findings

Post-event evaluations should be upgraded and broadened to cover the:

- increasingly important social and environmental impacts
- degree to which risks have been effectively managed
- potential for continuous improvement.

More comprehensive methodologies, that better reflect how the economy works, need to be introduced to assess the economic impact of the more significant major events.

There should be increased transparency covering both the workings and underlying assumptions of methodologies used to evaluate economic value.

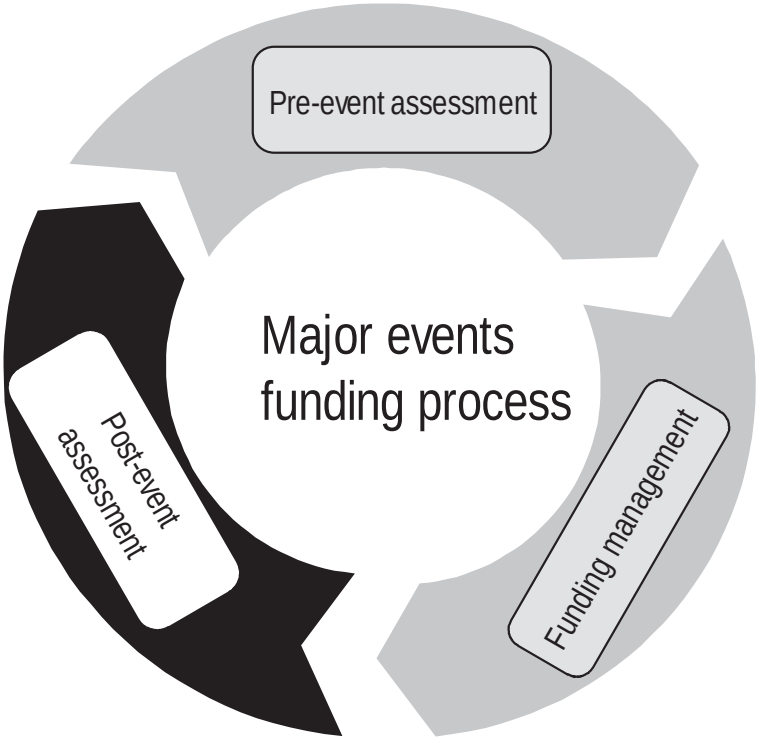
Explicit reconciliation between anticipated pre-event results and actual post-event evaluations is needed to improve accountability and better inform future decision-making.

Key recommendations

6.1 That economic impact assessment reports become more rigorous and transparent in terms of the:

- economic models used to estimate economic effects such as changes to Gross State Product and employment
- the rationale for key assumptions that have a material effect on the level of economic impacts.

6.2 In order for the government to be more comprehensively apprised, post-event assessments be broadened to take, where practicable, a triple bottom line approach embracing not only economic but social and environmental factors.



Source: Victorian Auditor-General's Office.

6.1 Background

The major events strategy was established to attract, create, financially assist and oversee a wide range of sporting, cultural and industry events. The state's financial investment in these events is substantial.

The Strategic Framework for the Approval of Major Events approved by the Major Events Cabinet Committee (MECC) requires that supported events be evaluated. Included in the evaluation is an assessment of the economic value derived from staging the event.

Assessments of economic value are particularly important for recurring events because they inform government decisions on whether to fund the event in the future after the expiration of the current agreement.

6.2 Economic assessment

6.2.1 Introduction

The following analysis and comments seek to examine both the assumptions used as inputs to economic modelling and the source and calculation of this data for both the Australian Formula 1 Grand Prix and other major events such as the Australian International Airshow, the Sail Melbourne International Regatta and the Melbourne Winter Masterpieces (Dutch Masters). Audit has indicated where it believes the assumptions and data informing these assumptions are contestable or not persuasive.

6.2.2 Approaches to economic assessment

A range of methodologies can be used to assess economic value. Each methodology carries with it particular perspectives and underlying assumptions. Each approach should be considered in terms of its fitness for purpose. This is particularly important as different approaches can produce widely differing results[1].

The key outcome from this audit from the application of these approaches should be that government is in receipt of the most complete information upon which to base its funding decisions on major events.

There are broadly 2 approaches that can be used for assessing the economic value of major events:

- cost benefit analyses
- economic modelling involving computable general equilibrium and input output approaches.

The robustness of the results obtained from these assessment approaches are dependent on:

- in the case of the cost benefit analysis, the quality of the data and the ability to accurately measure costs and benefits
- in the case of economic modelling, the theoretical basis for the construction of the model as well as the quality of the data.

Cost benefit analysis

Cost benefit analyses (CBA) assess the costs and benefits of an initiative or project. The CBA approach attempts to incorporate all of the costs incurred and the benefits received by the community. In addition to financial costs directly incurred by a new project, CBA also assigns a monetary value to any adverse or negative external effects (e.g. pollution). Similarly, CBA assigns a value to positive external effects as benefits.

A CBA approach can also capture those benefits derived from a project where it is difficult to determine a monetary value such as the promotion of cultural awareness, the fostering of civic pride and the enjoyment of a high level of community support. The CBA should indicate the relative importance placed on these non-monetary factors and support their inclusion with corroborating data[2].

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[1] Literature on event evaluation includes:
- J. Allen, R Harris, L Jago and A J Veal (eds), "Events Beyond 2000: Setting the Agenda", *Proceedings of Conference on Event Evaluation, Research and Education*, Sydney, July, 2000.
- T Black and S Kenaelly, "The Queensland IndyCar Grand Prix: Assessing Costs and Benefits", *Agenda*, vol. 1(2), 1994, pp. 259-264.
- J.P.A. Burns, J.H. Hatch and T. J. Mules, *The Adelaide Grand Prix: the Impact of a Special Event*, The Centre For South Australian Economic Studies, 1986.
- T Mules, "Taxpayer Subsidies for Major Sporting Events", *Sport Management Review*, vol. 1, 1998, pp. 25-43.

[2] For example:
- ACT Auditor-General's Office, July 2002, Performance Audit Report - V8 Car Races in Canberra, *Costs and Benefits*, ACT Auditor- General's Office, Canberra.

If the benefits exceed costs, there is a positive net social benefit and the project could proceed. Conversely, if costs exceed benefits, there is a negative net social benefit and the project should be modified or not supported.

The CBA approach assumes the economy's resources are fully employed unless there is specific evidence to the contrary.

CBA is a longstanding methodology for assessing the relative merits of proposed expenditure decisions. The CBA approach has been used in Canada by event organisers to justify receiving federal government support.

However, the CBA approach has its limitations in that:

- it does not measure flow-on effects and overall outcomes for an economy such as employment or income changes
- it is difficult to place a monetary value on some important categories of benefits and costs.

Economic modelling

Methods of assessing economy-wide effects recognise that the outputs of one industry are derived from the inputs from other industries. If one industry expands in response to the funding provided to support a major event, it will generate flow-on effects to other industries which can be ultimately reflected in changes to Gross State Product. Likewise, changes in relative prices (due, for example, to the impact of taxes and subsidies) can generate economy-wide effects.

These overall economic effects can be identified by modelling the economy. There are broadly 2 approaches to measuring these effects.

Input-output modelling

Input-output (IO) modelling is based on the premise that if one industry initiates an expansion of output in response to an increase in demand, the flow-on effects in other industries will result in an overall increase in production, employment and income which is larger than the initial expansion. In effect, the initial direct impact has been multiplied.

The approach uses national and regional IO tables to calculate output, employment and income "multipliers". The size of the multiplier for a region is dependent upon the extent to which the expanding industry draws its inputs from the region rather than through imports, and the degree to which additional income from increased employment is spent on goods produced in the region[3].

- A CBA evaluation is required from all promoters seeking federal government support in Canada. See: Sport Canada, *Sport Canada policy for hosting International Sport Events Appendix 11 guidelines for completing economic evaluations, viewed* 20 May 2006, http://www.pch.gc.ca/progs/sc/pol/accueil-host/ann-app-02_e.cfm.

[3] An example of this approach used in an event evaluation context is: Canadian Sport Tourism Alliance 2006, *2006 IIHF World Junior Championship Economic Impact Assessment*, March 2006.

The IO approach has been used in all recent evaluations of Victorian major events, including the Australian Formula 1 Grand Prix.

In essence, an IO model takes a growth perspective; anticipating that new expenditure will always contribute to higher levels of production, employment and income. There are, however, limitations to the IO approach; namely it:

- assumes that labour and equipment are, in effect, unemployed with no constraints on their availability which can lead to a tendency to overstate economic value
- assumes that a static relationship exists between inputs and outputs. In practice the economy is dynamic with significant changes occurring in such factors as productivity through changes in production technology, new product development and external competition
- is unable to incorporate price changes and their effects such as an increase in the costs of labour as a consequence of the increased demand.

The IO approach is further constrained by:

- the relevance of the most recent national input-output table which was based on the structure of the economy in 2001-02
- the high level of discretion that can be applied when disaggregating national tables to a state and regional industry level where these local levels of data are not available.

Computable general equilibrium modelling

Computable general equilibrium (CGE) models recognise that complex interactions occur in the behaviour of producers and householders as they act in their best interests. For example, businesses will seek to maximise profits; consumers will look for lowest prices for equivalent products. The actions of these various parties are explicitly modelled in a manner that reflects how these parties are seen to act in reality.

CGE models are dynamic. They capture how “shocks” to the economy (such as a major investment) change relative prices and the pattern of economic activity until all markets reach a new equilibrium.

The CGE approach specifically models business and household demand for goods and services, relative price changes and substitution effects (e.g. equipment for labour). It recognises resource constraints and considers the demand, price and income effects flowing from government policies and structural changes in the economy. CGE modelling therefore gives a more reliable picture of overall economic effects.

The CGE approach has been used in recent evaluations of major events such as the 2000 Sydney Olympic Games[4] and the 2003 Rugby World Cup in Sydney[5]. CGE modelling is also frequently used in other government contexts such as the modelling of major capital investments and free-trade agreements.

There are a range of drawbacks in the practical application of CGE modelling such as:

- Like IO modelling, it measures economic outcomes but does not capture all aspects of whether a project is worth proceeding with such as environmental and amenity effects.
- It is costly.
- It is only suitable for estimating the outcome of a substantial "shock". The economic advice provided to the audit indicates that an expenditure of at least $10 million is required before meaningful economic outcomes can be observed.
- The complexity associated with CGE model specifications and assumptions requires a high level of expertise to carry out the modelling exercise. Such expertise is limited in Australia.

6.2.3 Audit approach

Prior to the commencement of field work in 2006, audit released a discussion paper for agency comment outlining the parameters of its methodological inquiries. The paper canvassed the underlying perspectives, capabilities and limitations of various approaches to economic assessment.

The discussion paper sought to facilitate the development of a clear and transparent rationale for selecting the particular economic assessment approaches that would be used in this audit, particularly for the assessment of the 2005 Australian Formula 1 Grand Prix.

At the conclusion of these discussions, audit decided that CBA and CGE represented the most methodologically sound approaches to economic assessment for the following reasons:

- a CBA approach is a robust methodology that addresses the extent of net social benefit to Victoria from the Grand Prix itself however it cannot measure the level of economic activity generated from the event or the wider flow-on effects
- CGE provides a sophisticated and comprehensive modelling of the Victorian and national economies to measure the level of economic activity. CGE analysis cannot address the issue of whether a project is worth proceeding with; hence the need for a CBA approach.

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[4] JR Madden, "The Economic Consequences of the Sydney Olympics: The CREA\Arthur Andersen Study", *Current Issues in Tourism*, vol. 5(1), 2002, pp. 7-21, and JR Madden and M Crowe, *Estimating the Economic Impact of the Sydney Olympic Games*, Centre for Regional Economic Analysis, University of Tasmania, Hobart. 1998.

[5] URS Finance and Economics, *Economic Impact of the Rugby World Cup 2003 on the Australian Economy-Post Analysis,* a report for the Commonwealth Department of Industry Tourism and Resources, June 2004.

2005 Australian Formula 1 Grand Prix

The Australian Formula 1 Grand Prix attracts more Victorian Government funding than any other annual event. The ***2005 Australian Formula 1 Grand Prix*** was selected for examination because the 2006 event could have been atypically affected by the 2006 Commonwealth Games held shortly before the grand prix. An assessment of the economic impacts from the 2005 event was commissioned by the Australian Grand Prix Corporation using an IO approach.

2005 Australian Formula 1 Grand Prix.
(Image courtesy of the Australian Grand Prix Corporation.)

Other events

The audit also examined the economic impact assessments[6] and the following related non economic reports for:

- the **Melbourne Winter Masterpieces 2005 Dutch Masters**: A Marketing and Promotion Evaluation (January 2006) and an Exhibition Report - issued by the National Gallery of Victoria; Final Report issued by Art Exhibitions Australia (October 2005) and Independent Art Critique (September 2005)
- **Sail Melbourne 2006**: Strategic Directions Review (October 2004)
- the **2005 Australian International Airshow.** Final Report (September 2005).

Each of these events used the same economic assessment approach (IO) to estimate economic impacts. The audit took a collective approach to assessing the robustness of the approaches adopted to determine if they:

- were methodologically sound
- used soundly based assumptions and robust data underlying the economic assessments
- considered non-economic factors such as social and environmental impacts in post-event assessments.

6.3 2005 Australian Formula 1 Grand Prix

6.3.1 Background

The Australian Formula 1 Grand Prix was first held in Melbourne in 1996. The original home of the Australian Formula 1 Grand Prix was Adelaide where the event was held from 1985 to 1995.

Albert Park in Melbourne now hosts the Australian Formula 1 Grand Prix on a 5.3 kilometre street circuit around the Albert Park Lake. The circuit reverts to a public road after the event.

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[6] Ernst and Young, *Melbourne Winter Masterpieces: Dutch Masters Economic Impact Assessment,* a report for the Victorian Major Events Company, Arts Victoria, Art Exhibitions Australia and the National Gallery of Victoria, Melbourne, 6 October 2005.

- Ernst and Young, S*ail Melbourne 2006 - Economic Impact and Regional Expenditure Assessment*, a report for the Victorian Yachting Council, Melbourne, March 2006.

- National Institute of Economic and Industry Research, *Economic evaluation of the 2005 Australian International Airshow*, a report for the Department of Innovation, Industry and Regional Development, Melbourne, June 2005.

Australian Formula 1 Grand Prix Circuit, Albert Park, Melbourne

The Australian Grand Prix Corporation (AGPC) has set itself the following key goals for this event[7]:

- "To promote, organise and safely stage the Australian Grand Prix at Albert Park in accordance with the conditions under which the event has been secured or such other conditions as approved by the minister, and national and international rules and criteria, within budget
- To implement safety initiatives comparable with international best practice
- To maximise revenue and minimise expenditure in order to achieve or improve on the budget result as approved by Government
- To stimulate economic benefits to Melbourne and where practicable the state of Victoria
- To engender greater awareness of Melbourne, Victoria and Australia as a tourism destination for interstate and overseas visitors
- To have the Australian Grand Prix at Albert Park judged the best-organised Event on the FIA Formula One World Championship calendar."

To determine the extent to which the objective of stimulating economic benefits to Melbourne and Victoria was achieved, the AGPC commissioned assessments of the economic effects of the 1996, 2000 and 2005 events.

2005 Australian Formula 1 Grand Prix.
(Image courtesy of the Australian Grand Prix Corporation.)

[7] Australian Grand Prix Corporation, *Annual Report 2005*, Australian Grand Prix Corporation, Melbourne, p. 6.

6.3.2 Methodology and assumptions

The evaluation methodology used in the 2005 report included[8]:

- surveys conducted at the Albert Park race site of visitors, media representatives and competing teams to estimate levels of expenditure
- information collected from the AGPC such as race attendance and sponsorship details
- the estimation of the direct economic impacts which are then used in economic models of state and national economies to derive the economic effects of the GP on the Victorian and Australian economies.

The detailed workings behind the models used are proprietary and treated as commercial in confidence[9]. It is therefore difficult to evaluate them without complete and current documentation.

The audit sought clarification regarding the following aspects of the evaluation methodology and assumptions used in the 2005 report including assumptions regarding:

- the retained Victorian resident expenditure effect
- the enhanced Victorian resident expenditure effect
- the induced tourism effect.

The relevant responses have been incorporated in this report. Despite these responses, there remained some uncertainties over aspects of the economic evaluation approach adopted for the grand prix. These are briefly discussed below.

Retained Victorian resident expenditure effect

The retained Victorian resident expenditure effect was calculated as a direct impact of the grand prix on the Victorian economy comprising $17.7 million or 16 per cent of the total direct impacts.

The 2005 report defines this effect as “the retained expenditure in Victoria of Victorian residents’ expenditure that would have flowed out of the state if the event had been in Adelaide”[10]. In response to further clarification sought during this audit, audit was advised that “if the event had not been held in Melbourne it would otherwise have been held in South Australia. The historical justification for this assumption is simply the fact that the event before being held in Melbourne was in fact held in Adelaide” [11].

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[8] Ibid, pp. 3-4.

[9] Bureau of Transport Economics, *Facts and furphies in benefit-cost analysis: transport*, Report 100, Commonwealth of Australia, 1999.

[10] National Institute of Economic and Industry Research, op. cit., p.24.

[11] Department of Victorian Communities covering letter to the National Institute of Economic and Industry Research response, 9 November 2006.

There may have been an argument to acknowledge the expenditure flows that occurred from Victoria to South Australia when the event was held in Adelaide.

The grand prix now takes place in Melbourne, has done so since 1996, and will continue to do so for the foreseeable future. Therefore, it is difficult to reconcile the argument that expenditures that would have occurred if the grand prix was held elsewhere now constitute additional expenditure in Victoria for the 2005 event.

Even if it was thought worthwhile to estimate what outflows would have occurred if the event was held elsewhere, it has been noted that "It is very difficult to obtain reliable information about what locals would have done in the absence of the event. For this reason, it is recommended that retained expenditure be ignored in the calculation of inscope expenditure" [12]. [Note: inscope expenditure is defined as new spending coming to a region that would not have occurred without the event.]

Enhanced Victorian resident expenditure effect

The 2005 report estimated the enhanced Victorian resident expenditure effect as $11.6 million or 11 per cent of the total direct impacts from the grand prix[13].

The enhanced Victorian resident expenditure effect is defined as "the impact of major events on a sustained (average) reduction in the household savings ratio"[14]. It represents the extent to which Victorians use their savings to finance their expenditure at the grand prix. This additional expenditure is treated as a boost to the economy.

The 2005 report claimed that a significant proportion of Victorian residents (27.7 per cent) financed their grand prix expenditure from their savings, not from other sources such as reductions in their entertainment budget[15]. Similar effects were claimed in the 1996 and 2000 studies[16].

The critical issue is whether equivalent expenditures by Victorians would still occur if the grand prix did not to take place. If these expenditures were simply transferred from other activities in Victoria, then there can be no basis for including these expenditures as a new impact.

In response to audit inquiries, it was argued that Victorian household savings ratio had declined as a result of a greater choice in shopping hours; recreational services (gambling) and major events[17].

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[12] L Jago and L Dwyer, *Economic Evaluation of Special Events: A Practitioner's Guide,* Sustainable Tourism CRC, July 2005, p. 16.

[13] National Institute of Economic and Industry Research, op. cit., p. 33.

[14] Ibid., p.24.

[15] Ibid., p. 25.

[16] National Institute of Economic and Industry Research, *2000 Qantas Australian Grand Prix*, a report for the Department of State and Regional Development, July 2000, pp. 42-3.

[17] Department of Victorian Communities covering letter to the National Institute of Economic and Industry Research response, 9 November 2006.

However, there are other more persuasive reasons likely to account for the reduction in savings ratio[18] including the lower cost and increased accessibility to debt and wealth effects such as the increase in the value of owner-occupied housing.

There was a decline of 48 per cent in the saving ratio for Victoria between 1997-98 and 2002-3 as measured by the Australian Bureau of Statistics. Over the same period, the rate declined in NSW by 46 per cent and in Queensland by 43 per cent. This decline was therefore a relatively uniform national phenomenon rather than being unique to Victoria. From 2002-03 to 2005-06, the savings rate in Victoria has increased by 79 per cent and has returned to a level only slightly below that of 1997-98[19].

The audit found no research on major events that suggests that local attendance at an event is funded from savings to the degree allowed for in the 2005 report. There would be a stronger argument that attendance at a major overseas sporting event (e.g. the Beijing Olympics) would be funded from a running down of savings, however local attendance at the grand prix is more likely to be funded from a consumer's discretionary leisure budget.

Moreover, if savings intended to be spent in 2006 were in fact brought forward to 2005 because of the grand prix, then this effect would have a depressing impact on the Victorian economy in 2006. A reallocation of expenditure from one year to another cannot be considered as a net gain to Victoria over the long run.

Induced tourism effect

The induced tourism effect is defined as the "additional tourism activity generated in the Victorian economy from interstate and international tourism as a result of the exposure to Victorian tourism attractiveness from the Grand Prix" [20].This impact is restricted to net additional visitors to Victoria not associated with the Grand Prix.

The 2005 report valued this effect at $9.1 million which represents 8 per cent of total Victorian impacts from the Grand Prix[21]. The basis for the calculation of the induced tourism effect is contained in the 1996 report. This report states "there is no firm data available from the tourism research bodies on the impact of international exposure of Australian cities from major sporting events on induced tourism[22]."

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[18] For a discussion of the long-term decline in savings in Australia generally see Edey, Malcolm and Luke Gower, National Saving: Trends and Policy Reserve Bank of Australia, available at <http://www.rba.gov.au/PublicationsAndResearch/Conferences/2000/ EdeyGower.pdf> accessed 21 November 2006.

[19] Australian Bureau of Statistics, State Accounts, Australian National Accounts, Cat. no. 5220.0, 2005-06.

[20] National Institute of Economic and Industry Research, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*, A report for the Australian Grand Prix Corporation, August 2005, p. 29.

[21] National Institute of Economic and Industry Research, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*, A report for the Australian Grand Prix Corporation, August 2005, p. 29.

[22] National Institute of Economic and Industry Research, *Economic impact evaluation of the 1996 Transurban Australian Grand Prix*, July 1996, p.45.

The report further states that "The absence of information forces continued use of the "Olympic standard" prepared by NIEIR in 1990" [23]. This was based on an estimate that, had the Olympic Games been held in Melbourne, the induced tourism effect would be a 3.5 percentage point increase in Victoria's share of international tourism.

The 2005 report derived an approximation for the Grand Prix by first considering the television exposure time relationship between the two events. This showed that the Grand Prix had only 1.2 per cent of the audience per day relative to the audience per day estimated for the Olympics. As this was considered too low because of the frequency with which Melbourne was mentioned in the one-day broadcast of the Grand Prix, it was doubled to 2.4 per cent. This figure was then applied to the 3.5 percentage point increase from above (3.5 by .024) to give the estimated increase in the share of tourism enjoyed by Victoria and induced by the Grand Prix (0.08 of a percentage point increase or 60 000 additional nights) [24].

The estimate of the impact of induced tourism from the 1996 Grand Prix of $6.0 million (based on $100 per each additional visitor night) was increased for the 2000 evaluation by half the rate at which numbers of international and interstate visitors to the Grand Prix itself grew from 1996 to 2000, resulting in a value of $8.1 million. The estimate for 2005 of $9.1 million was derived by adding the rate of inflation to the 2000 estimate.

The 2005 report does not explain:

- the basis for the claimed increase of 3.5 per cent in induced tourism from the Olympics
- the link between the frequency of television messages about location on the broadcast of the Grand Prix and the ability to double the benchmark derived from estimates of induced tourism for an Olympics in Melbourne that did not eventuate
- the comparability of the Olympic Games which occur every 4 years and covers a large number of different events over longer period using a range of locations with a larger international audience. In contrast, a grand prix race takes place over a few hours on a single day at a particular race site with many grand prix races held throughout the world each year.

Some research does indicate that hosting major events on the scale of the Sydney Olympics increases promotion of an enhanced image particularly in terms of a winning location[25]. Other than raising awareness of a host destination, audit has seen no research that has actually quantified the level of increased tourism to a destination that occurred in the future as a result of staging a grand prix event.

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[23] National Institute of Economic and Industry Research, *Economic impact evaluation of the 1996 Transurban Australian Grand Prix*, July 1996, p.45.

[24] National Institute of Economic and Industry Research, *Economic impact evaluation of the 1996 Transurban Australian Grand Prix*, July 1996, p.45.

[25] G Waitt, *A Critical Examination of Sydney's 2000 Olympic Games in Festival and Events Management; An International Arts and Culture Perspective,* edited by Yeoman, I et al, Elsevier Butterworth Heinemann, Oxford, 2004.

6.3.3 Impact on modelling

Due to the level of uncertainty about the robustness of the assumptions around the retained Victorian resident expenditure effect, the enhanced Victorian resident expenditure effect and induced tourism, these were omitted from the modelling of the economic effects of the 2005 Formula 1 Grand Prix conducted by Allen Consulting Group in terms of the most likely scenario.

6.4 Economic impacts of other events

The economic impact assessments of the other major events commissioned by the relevant agencies and examined in this audit were all based on the IO method. However, there were differences in the application of this methodology:

- the economic assessment of the Australian International Airshow used a detailed IO modelling approach whereas
- the assessments of the Sail Melbourne and Dutch Masters events used a single simple multiplier to estimate economic impacts.

6.4.1 Underlying assumptions and data

The audit examined the assumptions and data used in the economic assessments for the 3 events focusing on:

- input output multipliers
- trade gains in exhibitors sales
- taxation effects
- additional expenditure assumptions (other than trade gains).

Input output multipliers

The concept of multipliers involves the degree to which the initial direct impact of additional expenditure is multiplied throughout other industries in terms of increased production, employment and income. Multipliers vary depending upon the area of the economy primarily affected. It could therefore be expected that the size of the multipliers used for assessing major events would differ depending on the area upon which the event impacts.

The multiplier in the Dutch Masters and Sail Melbourne economic impact assessments (EIA) are the same (1.823) and are very similar to the implicit multiplier in the Airshow economic impact assessment report (1.83).

The audit was advised that the common multiplier used for Sail Melbourne and the Dutch Masters was "based on tourism dependent industries within the Victorian economy"[26]. The audit was also informed that the same multiplier was used for the Airshow, based on "the assumption we would be measuring the economic impact of the Airshow based on visitor spend predominantly within the tourism and hospitality industries"[27].

The economic impact from Sail Melbourne or the Dutch Masters events is substantially based on additional tourist expenditure. However, as detailed below, the 2005 Airshow assessment indicated that 40 and 74 per cent of its direct impacts on the Victorian and national economies respectively were derived from trade gains from Victorian and Australian exhibitors. These impacts were not related to the tourism and hospitality sectors. If multipliers are to be used, they should at least reflect the nature of the industry impacts of the major event.

Trade gains in exhibitors' sales at the Australian International Airshow

Economic impacts that result from an event should in principle be expenditures that would not otherwise have occurred in Victoria (or Australia if the event is evaluated on a national basis rather than a state basis).

Forty per cent of the impacts on the Victorian economy from the Airshow were claimed to be derived from sales by Victorian exhibitors that would not otherwise have occurred, and 74 per cent of the impact on the Australian economy was estimated to come from sales by all Australian exhibitors.

Figure 6A below shows the full range of impacts of the Airshow on the Victorian economy based on the economic evaluation of the 2005 event.

[26] Department of Victorian Communities covering letter to the Ernst and Young response, 9 November 2006.

[27] ibid.

Figure 6A
Direct impacts of the Australian International Airshow on the Victorian economy

	($m)	Total (%)
Victorian enhanced visitor effect	10.50	19.34
Victorian enhanced duration effect	0.08	0.14
Retained Victorian resident expenditure	9.36	17.24
Enhanced Victorian resident expenditure effect	1.60	2.95
Expenditure by interstate and overseas exhibitors	3.67	6.76
Conference expenditure	0.50	0.92
Retained Victorian exhibitor expenditure	1.00	1.84
Trade gains by Victorian exhibitors	21.87	40.28
Media related expenditure	0.32	0.59
Other (Airshows Downunder budget)	5.4	9.94
Total Victorian direct impacts	**54.30**	**100.00**

Source: National Institute of Economics and Industry Research, Economic Evaluation of the 2005 Australian International Airshow, June 2005.

The post-event assessment estimates additional sales of $260 352 per Victorian exhibitor. These sales were not actually made at the Airshow but were estimates based on questions to a sample of exhibitors on anticipated sales to be made in the following period.

The extent to which these sales would not have occurred but for the Airshow was determined by a further question related to whether an exhibitor would have travelled to another location in Australia or overseas to exhibit if the Airshow was not held in Melbourne.

Since most sales occur subsequent to the Airshow, there is no definitive link between a Victorian exhibition at the Airshow and additional sales that would otherwise not have occurred.

The assessment also assumes that the expected actual additional sales at both the state and national levels are all exports or replacement of imports that would otherwise have occurred. This assumption is applied to the estimated $21.9 million worth of sales by Victorian exhibitors and the $45.6 million in anticipated sales by all Australian exhibitors.

By not making allowances for imports, the level of economic impacts from the Airshow is boosted. A more conservative and realistic assumption would have given some recognition to the extent to which there is an import component included in the claimed estimated additional export or import replacing sales.

2005 Australian International Airshow.
(Image courtesy of the Department of Innovation, Industry and Regional Development.)

Taxation effects

One of the claimed benefits of major events is that the additional expenditures in Victoria will contribute increased taxation revenue to the Victorian government. Tax receipts such as payroll taxes and gambling taxes are expected to increase as a result of events that bring in new expenditures to Victoria.

The Dutch Masters evaluation estimates an increase in state taxation of $1.525 million. This was calculated by using a multiplier of 0.117 applied to the total direct expenditure of $13. 03 million[28], which means, in effect, that 11.7 per cent of all the increase in direct expenditure as a result of the event represents tax receipts. No explanation is provided in the assessment as to how this multiplier was derived. In response to further inquiries, the audit was advised that this multiplier "was based on tourism dependent industries"[29], but no further explanation was provided.

The estimate has a material effect on the level of reported economic effects from the event and therefore the key assumptions and methodologies underpinning this estimate should be more transparent.

[28] Ernst and Young, *Melbourne Winter Masterpieces: Dutch Master, Economic Impact Assessment*, 6 October 2005, p. 13.

[29] Department of Victorian Communities covering letter to the Ernst and Young response, 9 November 2006.

The GSP for Victoria for 2004-05 was estimated by the Australian Bureau of Statistics at $222.022 billion[30]. Victorian taxation receipts for 2004-05 were $10.355 billion[31]. The ratio of taxation to GSP (the average tax rate) is 4.66 per cent.

However, the ratio of the increase in taxation to the increase in GSP for the 3 events examined was:

- 4.58 per cent from the Airshow, (a figure slightly less than the average tax rate for the Victorian economy[32])
- 6.42 per cent from the Dutch Masters
- 6.41 per cent [33] from Sail Melbourne (which used the same methodology).

In other words, the economic impact assessments for the Dutch Masters and Sail Melbourne events claimed an effective tax rate 38 per cent higher than the average tax rate for the economy as a whole.

The agencies responsible for these economic impact assessments explained these variations in taxation rates as due to "The higher marginal rate compared with the average would be explained by the composition of the taxation revenue increases and the elasticity of taxation revenue with respect to economic activity, for example from the threshold exemptions for Payroll Tax"[34].

A more detailed explanation is needed, given that enhanced taxation receipts from these events are included as a benefit to Victorians in economic impact assessments.

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[30] Australian Bureau of Statistics, State Accounts: Australian National Accounts cat. no. 5220.0 released 9 November 2005.

[31] Victorian Government*, Budget Paper Number 2, Strategy and Outlook*, p. 41.

[32] National Institute of Economics and Industry Research, *Economic Evaluation of the 2005 Australian International Airshow,* June 2005, p. 39.

[33] Ernst and Young, Sail Melbourne 2006*, Economic Impact and Regional Expenditure Assessment*, March 2006, p. 12.

[33] Department of Victorian Communities covering letter to the National Institute of Economic and Industry Research response, 9 November 2006.

[34] Department of Victorian Communities covering letter to the National Institute of Economic and Industry Research response, 9 November 2006.

Melbourne Winter Masterpieces – Dutch Masters.
(Image courtesy of NGV photographic services.)

Retained Victorian resident and exhibitor expenditure effect

The retained Victorian resident and exhibitor expenditure effect accounts for 19.08 per cent (17.24 plus 1.84) of the total impacts of the Airshow.

This effect refers to the retention of expenditure in Victoria by Victorian residents and exhibitors, that would have been spent in another state in Australia or overseas had the event not been held in Victoria.

Because the Airshow was held in Victoria and not in another state and will be held in Victoria in the foreseeable future, the validity of treating this effect as additional expenditure to Victoria in terms of direct economic impact is questionable. Comments in relation to the grand prix made earlier in this part of the report are applicable to the Airshow.

Enhanced Victorian resident expenditure effect

The enhanced Victorian resident expenditure effect is based on the rationale that Victorian attendees finance their expenditure on a major event by reducing the household savings ratio, and that this expenditure would not have occurred had the event not taken place. Because it is treated as a direct economic impact, it has the effect of boosting the overall economic impact derived from the event.

The claimed economic impacts are not well supported by research and the validity of the assumption must therefore be questioned. This assumption was also applied to the evaluation of the grand prix and was discussed in more detail earlier in this part of the report.

6.4.2 Coverage of non-economic factors

Non-economic factors were not covered in post-event evaluations. From an accountability point of view and to inform any decision-making on the future funding of events, it is important that there is an evaluation of the full range of impacts from a major event.

Anticipated social/community and environmental impacts from major events are described in very general terms in the Major Event Assessment Statement. In addition, the *Strategic Framework for the Approval of Major Events* refers to the need to demonstrate other benefits such as broader community benefits in the absence of significant economic benefits.

Social/community and environmental impacts however are not addressed as part of the post event assessment. While environmental impacts for certain events (e.g. cultural events) might be small, there is still an impact in terms of the consumption of energy and water and the generation of waste that should be acknowledged.

Further comment on how non-economic factors could be reported and assessed are covered in Part 7 of this report.

Risk management strategies are also referred to in the MEAS. However:

- While in some agreements such as the Airshow, there is a requirement for event organisers to submit a risk management strategy prior to the event's commencement, this was not the case with all agreements
- while event organisers for the Airshow reported on the management of risks (in other events examined, this was not the case), the independent confirmation of the extent to which event organisers have effectively managed risks could be addressed in post event assessments.

The completion of an event also provides the opportunity to develop a ***continuous improvement process***. The organisers of the Sail Melbourne event have developed a comprehensive continuous improvement process that:

- identified lessons learnt and problems experienced
- involved a debriefing with all key stakeholders
- assigned responsibility for implementing recommendations for improvement.

The degree to which a robust continuous improvement review was conducted should be part of the post-event evaluation.

6.4.3 Reconciliation of pre event assessments and post event results

The pre event MEAS is intended to be a comprehensive assessment of a wide range of potential impacts. Post event evaluation should "close the loop" on these assessments by determining the extent to which impacts anticipated pre event have eventuated.

There would be advantages in MECC receiving a reconciliation of the pre and post event evaluation results from VMEC as this would assist MECC in:

- building its background knowledge of factors that led to differences between pre-event estimates and post-event assessments and to incorporate relevant factors into future decision-making
- increasing its understanding of the way future pre event estimates should be undertaken.

In due course, this reconciliation should progressively extend to the coverage of non-economic factors as well as economic impacts.

6.4.4 Conclusions

There are more reliable and robust methodologies than the current approach to economic assessment that is used to estimate the economic effects of major events. Some of the assumptions used in the economic assessments that audit examined had the effect of inflating the economic value derived by Victoria from these events.

The assessment of other than economic impacts in post event assessments was under developed. In this regard, Victoria is not unique. This is also the case in other States and overseas but this should not preclude addressing these increasingly important considerations.

There are also advantages in having a stronger linkage between the anticipated pre-event impacts and actual post-event results by providing MECC with a pre and post event reconciliation.

Recommendations

6.1 That economic impact assessment reports become more rigorous and transparent in terms of the:

- economic models used to estimate economic effects such as changes to the Gross State Product and employment
- rationale for key assumptions that have a material effect on the level of economic impacts.

6.2 In order for the Government to be more comprehensively apprised, post event assessments should be broadened to take, where practicable, a triple bottom line approach embracing not only economic but social and environmental factors.

6.3 That contractual agreements include a requirement for organisers to:

- submit to the responsible agency a risk management strategy prior to the event's commencement
- undertake a continuous improvement process involving representatives of key stakeholders such as event organisers, government agencies, peak bodies and the community.

6.4 That post event assessments address the effectiveness of risk management and continuous improvement arrangements.

6.5 That VMEC provides the Major Events Cabinet Committee with a reconciliation between the pre event assessments and post event results.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 6.1

The Department of Innovation, Industry and Regional Development (DIIRD) will work with the Department of Treasury and Finance, VMEC and other relevant agencies to prepare guidelines to assist in the economic assessment of major events (recommendation 7.1 also refers).

Recommendation 6.2

Triple bottom line assessment is agreed to be of value to evaluation. The Auditor-General's acknowledgement that there is currently no uniformly agreed approach is noted, and DIIRD will continue to work within this constraint to research and develop an approach to this form of evaluation (recommendation 7.3 also refers).

Recommendation 6.3

Consistent with the response made to recommendation 4.3 and 6.4, and recognising that the Auditor-General found that contracts with event organisers were well managed, consideration will be made to strengthen the contractual arrangements between government and event organisers to address risk and maximise the outcomes for all involved, where appropriate and feasible.

Recommendation 6.4

To complement the pre-event risk management analysis enhancements (recommendations 4.3 refers), and in-line with recommendations to improve post-event assessments, the effectiveness of risk management and continuous improvement arrangements will also be addressed.

Recommendation 6.5

DIIRD will work with VMEC and other relevant agencies to ensure timely and cost efficient pre and post event reconciliations are prepared.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 6.1

VMEC, in conjunction with the relevant Government Departments, welcomes further discussion and debate around the most suitable models for economic impact assessment.

All economic impact assessment methodologies have strengths and weaknesses that stem from the varied assumptions and methodologies that underpin them and all are and should be the subject of ongoing assessment. To date, the events industry, both nationally and internationally, has not agreed on a single model. VMEC has been involved in this debate both formally and informally for some time.

The current economic assessment model generally used in Victoria has been carried out by reputable independent experts, who have had considerable experience in major event economic benefit analyses and have performed studies interstate and overseas. The use of a consistent model has allowed comparison of economic benefit of an individual event over time and between different events.

VMEC will support the work of other Government agencies to continue to ensure appropriate economic impact assessment reports are prepared for major events.

Recommendation 6.2

VMEC welcomes the introduction of triple bottom line assessments for particular events and has for some time promoted the value this would bring to the evaluation process. Since its inception in 2000, the current MEAS framework has required that social and environmental factors be considered, as well as any economic and media exposure benefits of major events.

A significant amount of work has been undertaken in Australia and overseas to create workable model, however as noted by the Auditor-General, there is currently no uniform agreed approach. VMEC has for some time been part of a national advisory panel dealing with the objective of developing triple bottom line methodologies, evidence and measurement indicators.

VMEC supports the development and implementation of a practicable and cost-effective triple bottom line assessment.

Recommendation 6.4

As part of their contractual obligations the majority of major events currently submit and report against their risk management strategies and operations plans, as part of their standard management and reporting. VMEC supports this work being addressed through the post event assessment.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company - continued

Recommendation 6.5

VMEC currently provides a post-event presentation to MECC and supports the reconciliation of these results.

7 Areas for improvement

At a glance

Key recommendations

7.1 That guidelines be developed by the Department of Treasury and Finance (DTF), in consultation with relevant agencies and the Victorian Major Events Company (VMEC), for the economic assessment of major events based on the size of government funding and the expected effects on the economy.

7.2 That agencies, in consultation with the Department of Treasury and Finance and the Victorian Major Events Company, establish a panel of preferred contractors to undertake major economic assessments.

7.3 That a lead agency be nominated to work in consultation with key agencies, including the Victorian Major Events Company, to establish a program to progressively implement, as practicable, the assessment of social and environmental impacts of major events.

7.1 Introduction

The preceding parts of this report have examined individual major events from the perspectives of the economic value derived by the Victorian economy, and the soundness of the arrangements employed by agencies in managing and evaluating specific events.

This part of the report draws upon some of the themes and issues identified to summarise the lessons learned as the basis for future enhancements.

These themes and issues cover the need for:

- preparing guidelines for the economic assessment of major events
- establishing good practice principles for survey design and application
- establishing a panel of preferred contractors
- strengthening, where practicable, the focus on assessing social and environmental impacts
- increasing the public reporting of outcomes from major events.

Each of these is detailed below.

7.2 Preparing guidelines for the economic assessment of major events

Agencies associated with the promotion of major events are required to submit a Major Events Assessment Statement (MEAS) to the Major Events Cabinet Committee (MECC) when they seek to obtain funding to support a major event.

The rationale for support for major events should be that, while an event may not be able to cover all of its costs through admission charges or sponsorship, it is worthy of support because the event generates benefits for Victorians. These benefits should not only cover economic factors but also embrace other community benefits.

Given that governments have alternative uses for funds, it should be expected that any request would demonstrate the nature and extent of the benefits to justify the request for funds. Furthermore, after an event, there should be an obligation on agencies to demonstrate the extent to which those benefits have in fact been achieved.

It is noted that *The Strategic Framework for the Approval of Major Events* (see Part 4 of this report), while not prescribing a ratio of government funding to an event's economic effect, indicates that this would normally be in the range of 1:5 to 1:12. This may need to be re-examined in the light of any further development of guidelines on economic assessment.

7.2.1 Pre-event submission to MECC

The MEAS would be improved if, in addition to the statement of the agency's expected income and expenses, a cost-benefit analysis (CBA) was also conducted outlining the expected additional benefits and costs that might be received or borne by the Victorian community.

Some of these additional benefits and costs will be difficult to assign a monetary value to, as they include intangible items such as increased cultural awareness. These aspects should at least be referred to in a qualitative sense and will likely require additional information gathering strategies such as the use of community surveys.

For MEAS that seek to roll-over existing agreements, the results of impact analysis based on an input/output (IO) approach are used to justify government funding for the event. This type of analysis, however, will only determine the effect on the economy of additional expenditure not whether the event should be considered for funding. A CBA determines whether the event is worth proceeding with by measuring the costs against the benefits to arrive at a net benefit either positive or negative (see Part 6 of this report).

It is also important that these benefits are considered in the context of the level of funding sought and that it is demonstrated that the overall net benefit is positive. This should apply to all requests for funding for major events brought to MECC, whether they are for new or continuing events.

The adoption of a CBA approach is in line with other overseas organisations that have guidelines which require a CBA for major events[1].

Agencies, with appropriate support, should be able to develop the capability to present data in a cost-benefit framework using the existing guidance statements[2].

7.2.2 Post-event economic assessment

The *Strategic Framework for the Approval of Major Events* adopted by the MECC in October 2000 recommended the development of a standard approach to the economic evaluation of major events.

[1] Sport Canada, *Sport Canada policy for hosting International Sport Events Appendix 11 guidelines for completing economic evaluations*, viewed 20 May 2006, <http://www.pch.gc.ca/progs/sc/pol/accueil-host/ann-app-02_e.cfm>. Also refer to National Commission of Audit, *Report to the Commonwealth Government*, June 1996.

[2] Commonwealth Government guidelines such as *Introduction to Cost-Benefit Analysis and Alternative Evaluation Methodologies* and *Handbook of Cost-Benefit Analysis* are available at: <http://www.finance.gov.au/finframework/fc_2006_01.html>.

A report was prepared by the Centre for Tourism Research, University of Canberra for the then Department of State and Regional Development (now Department of Innovation, Industry and Regional Development) on the development of an economic evaluation framework for major events[3]. The recommended approach was known as the CRC model. The consulting firm, Ernst and Young, was commissioned by the then Department of Tourism Sport and Commonwealth Games to provide a report on the practical application of this model.

In its report, Ernst and Young identified a range of problems with the CRC model such as the requirement for detailed data that, in their view, was difficult to obtain and costly to apply[4]. In October 2002, the MECC agreed to maintain the existing multiplier model as the preferred economic impact assessment tool.

As indicated earlier in this report, an economic assessment using IO multipliers has the tendency to overstate the impact of an event on the Victorian economy. The more comprehensive CGE analysis provides government with a more reliable approach when assessing impacts on the Victorian economy, and should be applied to larger events that have the capability of generating significant outcomes for the Victorian economy.

However, it is accepted that CGE analysis is costly and does not readily measure small economic impacts. A 2-stage approach to post-event economic assessment of major events based on the materiality of government funding is, therefore, suggested.

Events with annual government funding up to $10 million

It is suggested that agencies with events requiring annual funding up to $10 million should be required to report to MECC against a suite of key performance measures (e.g. interstate and international visitor expenditure directly related to the event) rather than undertake the type of economic assessment currently used. These economic assessments attempt to demonstrate the impact of an event on gross state product (GSP) and its components, employment and taxation receipts.

The majority of major events funded from the major events cap in 2004-05 and 2005-06 would fall within this threshold; indeed, most of the major events receive government funding of less than a million dollars annually.

It is suggested that the post-event reporting requirement to MECC should then consist of:

- a reconciliation of the expected income and expenses incurred by the agency as outlined in the MEAS with the actual income and expenses
- a reconciliation of the expected additional benefits and costs that will be received, or borne, by the broader Victorian community with an analysis showing the extent to which the expected outcomes were achieved

[3] Centre for Tourism Research, University of Canberra, *Standard Assessment Guidelines for Major Events*, December 2000.

[4] Ernst and Young, *CRC Model Report*, Department of Tourism, Sport and Commonwealth Games, September 2002.

- a revision of the CBA initially provided to MECC at the pre-event stage based on the post-event information in the previous 2 points
- the calculation of new spending that comes to the state that would not have occurred had the major event not been staged[5]. These measures could include:
  - attendance by Victorian, interstate and international visitors compared with pre-event estimates
  - spending by interstate and international visitors
  - spending by event organisers and sponsors within Victoria that has been sourced from outside of the state.

These measures of spending are similar to those used by the Western Australian Tourism Commission to report on direct expenditure flowing into the Western Australian economy as a result of an event.

Spending by locals at an event is excluded as a performance measure on the basis that if the major event had not occurred, any spending on the event would have been applied to other goods and services in the state. In other words, this expenditure is seen to be transferred rather than additional. However, ticket sales or attendance numbers by Victorians provide a guide to the social value attached to these events by Victorians.

Annual post-event reporting requirements should apply to both one-off events and those events that are held over a number of years. Annual post-event evaluations provide both government and the agencies with regular updates on the performance of an event over the life of the agreement with event organisers and relevant information if the agreement is renewed.

Events with additional annual government funding above $10 million

Events seeking $10 million or more in annual government funding should be required to undertake the same reporting requirements and CBA as set out above for events that require less than $10 million in government funding.

Expenditure of at least $10 million is required to generate sufficient impact in an economy the size of Victoria to meaningfully measure its effects under a computable general equilibrium (CGE) model, which is audit's preferred approach.

For these larger events, this modelling should be used to assess their impact on the Victorian economy in terms of changes in GSP and its components (consumption, investment and trade) and employment.

While the use of a CGE model will incur a cost in terms of the engagement of external contractors, the number of major events with annual funding in excess of $10 million is small. It is also suggested that CGE economic assessments could be conducted periodically, perhaps every 3 to 5 years or at the completion of a one-off event.

[5] L Jago and L Dwyer, *Economic Evaluation of Special Events: A Practitioner's Guide*, Sustainable Tourism CRC, July 2005, pp. 12-13.

Summary of potential MECC reporting requirements

Table 7A below summarises the above comments on pre and post event reporting to MECC.

Figure 7A
Potential MECC economic assessment reporting requirements

	Pre-event assessment	Post-event assessment
Events up to $10 million	• Clear statement of expected income and expenses • CBA outlining the expected additional benefits and costs	• A reconciliation between expected and actual income and expenses • A reconciliation between expected and actual additional benefits and costs • A revision of the pre-event CBA based on actual information relating to the above • Reporting against a suite of key performance indicators covering additional spending related to the event (e.g. interstate and international visitors expenditure).
Events above $10 million	• As above	• As above • CGE modelling of an event every 3 to 5 years or at the completion of a one-off event.

Source: Victorian Auditor-General's Office.

Recommendation

7.1 That guidelines be developed by the Department of Treasury and Finance (DTF), in consultation with relevant agencies and the Victorian Major Events Company (VMEC), for the economic assessment of major events based on the size of government funding and the expected effects on the economy. Consideration should be given to:

- the use of CBA at the pre-event stage for all events considered by MECC to determine the degree to which anticipated net benefits match the funding sought
- an updating of the pre-event CBA at the post-event stage
- for smaller events, the reporting at the post-event stage should be against a suite of key performance indicators such as expenditure by interstate and international visitors directly attributable to the event
- investing in the use of CGE modelling for larger events at the post-event stage to assess their impact on the economy.

RESPONSE provided by the Secretary, Department of Treasury and Finance

Recommendation 7.1

DTF supports the preparation of guidelines to assist in the economic assessment of major events.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 7.1

DIIRD will work with the DTF, VMEC and other relevant agencies to prepare guidelines to assist in the economic assessment of major events. Account will necessarily be taken to develop guidelines appropriate to the scale and nature of events, and to account for the measurement of brand and destination awareness benefits to the State.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 7.1

VMEC, as noted at 6.1, welcomes an ongoing discussion and analysis of the economic impact assessment of events based on the level of government funding provided, and the expected affects on the economy, Such discussion should also consider other government objectives in investing in major events, namely branding and reputational benefits that flow from the generation of national and global media exposure for Melbourne and Victoria.

To develop of an industry-relevant national model, it would be valuable to consult with other Australian States and the event sector before adopting the most appropriate economic impact assessment model for each type of event.

VMEC will support the work of other Government agencies to ensure appropriate economic impact assessment reports are prepared for major events.

7.3 Establishing good practice principles for survey design and application

The gathering of information by surveys during a major event provides some of the most crucial post-event information (e.g. expenditure profiles of interstate and overseas visitors to the event) in either reporting on key performance measures (as recommended above for smaller major events) or in conducting CBA and CGE economic assessments. It is vital that information gathered from surveys is reliable. In many cases, data collected by survey remains the only consolidated source of information.

It is unclear, from the economic impact assessments of major events examined during this audit, of the extent to which there was compliance with good practice in survey design and application.

There is a need for a set of principles to be developed to ensure survey accuracy and reporting by external contractors. These principles should cover[6]:

- **Sampling methods**. The sample must be randomly selected over the duration of the event and stratified for example, to reflect full range of attendees. The required sample size should reflect a confidence level to yield a given level of sampling error.
- **Data collection methods**. Data collection should be tailored to the circumstances of the respondents. For example, event attendees could be surveyed in face to face interviews, however, for a survey of businesses, telephone or a mailed survey may be more appropriate.
- **Response rates**. Strategies should be developed to increase response rates and reduce the potential for sample bias.
- **Sampling precision**. Survey findings obtained from a sample group are subject to a degree of sampling error; that is the results may differ if a different sample had been selected. Samples should be large enough to keep sampling errors to plus or minus 5 per cent or less.
- **Validity of measurement**. The planning and development of a valid survey should reflect the purpose for conducting the survey.
- **Reliability of measurement**. Issues of reliability involve the extent to which a survey would give similar results if the survey was administered more than once to the same group of people. This should be addressed in the survey planning and development, and is a function of the random measurement error in the data.

7.4 Establishing a panel of preferred contractors

This report highlights the opportunity to improve the level and quality of information provided to the MECC at the pre-event approval stage and also raises reservations about the reliability of post-event assessments particularly regarding:

- the methodology and assumptions used by contractors to assess economic impacts and outcomes
- the level of transparency regarding the detailed working of models used to arrive at economic outcomes and survey design and application methods.

As indicated earlier, the recommended approach for assessing the more significant major events is CGE modelling. While this approach has broad acceptance in other fields such as major infrastructure development, it is not currently used within the major events area in Victoria.

[6] Office of the Auditor General for Western Australia, Listen and Learn, Using customer surveys to report performance in the Western Australian public sector, Report No. 5, June 1998.

There would be merit in establishing a panel of preferred contractors with a proven track record in this approach to conduct CGE assessments. A panel would provide:

- an additional level of assurance that contractors possess the requisite skills in key areas
- efficiencies in the procurement process
- the ability to mandate compliance by contractors with predetermined standards for conducting economic assessments.

It would also be of benefit to involve DTF in the panel selection process as it possesses expertise to judge the economic credentials of potential panel members. From an efficiency perspective, the establishment of a single panel covering all areas of government activity, including major events, would seem desirable.

In establishing a panel of preferred contractors, the request for tender should include a set of conditions that contractors are expected to adopt or conform to. These conditions include:

- disclosing (on a confidential basis if requested) the detailed workings of their proposed economic assessment methodology
- complying with suggested guidelines on the conduct of economic assessments
- demonstrating compliance with proposed good practice survey design and application principles as part of the data collection process such as those outlined above
- maintaining and making available for review relevant working papers that support preliminary and final results
- providing, as one of the key contract deliverables, a detailed technical appendix outlining data used, estimation procedures, simulations, modelling procedures, interpretation of the model outcomes, key assumptions used in the analysis and final results.

Recommendation

7.2 That agencies, in consultation with the Department of Treasury and Finance and VMEC, establish a panel of preferred contractors to undertake major economic assessments.

RESPONSE provided by the Secretary, Department of Treasury and Finance

Recommendation 7.2

DTF will consult with VMEC and relevant agencies on the selection of preferred contractors to undertake major economic assessments.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 7.2

A business case supporting the benefit of establishing a panel of preferred contractors to undertake major economic assessments is required. It is questionable whether a benefit would be proven, given the relatively small number of potential panelists and the correspondingly small number of events that would benefit from comprehensive economic assessment.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 7.2

VMEC notes that there are relatively few qualified practitioners in the field and therefore it is questionable whether a panel would be cost effective. This will be considered in consultation with the relevant Government Departments.

FURTHER comment by the Auditor-General

My report envisages that the establishment of the recommended panel should cover economic assessments in the full range of government activities.

7.5 Strengthening the focus on assessing social and environmental impacts

While the MEAS requires consideration of social and environmental impacts, the audit noted that details contained in the MEAS and in subsequent post-event assessments concentrate heavily on economic issues. The available approaches to the assessment of environmental and social impacts and how these can be applied to major events at both the pre- and post-event assessment stages are briefly outlined below.

7.5.1 Available approaches for assessing social and environmental impacts

Approaches to the assessment of environmental impacts are well documented[7] and the impacts should be relatively easy to monitor for major events. The key factors in assessing environmental impact relate to energy, water use and waste generated (both landfill and recycling), and the energy used in transportation of attendees to the event. The environmental assessment could also address the use of renewable energy and recycled water. (In the case of the 2007 FINA World Swimming Championships held in Melbourne, water was recycled for use at the Royal Botanic Gardens.)

[7] For a summary of environmental reporting in the Victorian public service, refer to Public Accounts and Estimates Committee, *Sixty ninth report to the parliament*, *Report on the 2004-05 Budget Outcomes*, Victorian Parliament, Melbourne, April 2006, pp. 107-28.

Little has been done in this area in relation to major events in general. Assessment of the social impact of major events is, however, more problematic. Research on approaches to measure social impact can be summarised into the following 3 broad categories[8]:

- Surveys to identify the perceptions of local residents within the immediate vicinity of a major event on their quality of life.
- Social impact assessments to estimate in advance the social consequences that are likely to flow from major events. This involves profiling existing social conditions, projecting likely social change, assessing the relative importance of expected changes and evaluating the acceptability of the predicted level of change. There are few examples of the use of this technique in the major events area.
- Techniques such as contingency valuation to assign monetary values to social impacts by requesting residents to estimate the degree to which they are willing to pay to secure or avoid a major event.

The use of surveys as an initial step to record the impact on quality of life at both an individual and whole-of-community level is currently the most practical means by which social impacts could be assessed. For smaller regional events, these surveys could be confined to seeking the views of local residents within the host region. For more significant events that have an influence across the state such as the Australian Formula 1 Grand Prix, a broader Victorian community view could be sought in addition to the views of the local community.

There would also be advantages in increasing the emphasis on social and environmental factors, particularly for smaller events or cultural events where it is difficult to compete for government funding with larger (usually sporting) events in terms of the level of economic effects.

Audit would support the development of a standard social survey instrument for major events which would seek to cover the impact of the event, where relevant, on:

- entertainment opportunities, especially in smaller communities where such opportunities are limited
- community pride and feelings of living in a state, city or region which is the centre of attention
- community social capital, that is promoting shared effort, unity and volunteerism
- encouraging positive behaviours such as sporting activity
- developing and maintaining facilities for events which provide a legacy for the community.

A balanced social impact assessment scale should also attempt to measure potentially detrimental social impacts, including:

- encouraging negative behaviours such as rowdy and/or delinquent behaviour
- denial of access to community facilities for a substantial periods of time

[8] L Fredline, M Raybould, L Jago and M Deery, *Triple Bottom Line Event Evaluation: A Proposed Framework for Holistic Event Evaluation*, Proceedings of the Third International Event Conference, The Impacts of Events: Triple Bottom Line Evaluation and Event Legacies, UTS, Sydney, July 2005, pp. 2-15.

- disruption to a community's way of life such as road closures and parking restrictions
- negative impacts on the community amenity such as exposure to high noise levels particularly where this is severe and impacts on some sectors of the community more than others.

The social survey approach is particularly valuable when comparing the results from the same event over time or with other events.

7.5.2 Future challenges

As mentioned previously, relatively little work has been done in the assessment of the social and environmental impacts of major events both in Australia and overseas. In particular, progressing the assessment of the social impact of major events beyond the use of community surveys poses significant challenges.

Researchers tend to use a numeric scale to record perceptions of the impact of the event both on the personal quality of life of individuals and on the host community as a whole[9]. One of the complications when assessing social impacts is the difficulty in their translation into monetary terms. This places any consideration of social impacts at an immediate disadvantage in comparison with assessments of economic impacts which are expressed in monetary terms and consequently more likely to secure government funding approval.

The difficulties in assigning monetary values to social impacts, however, should not prevent the use of techniques that result in expressing impacts in non-monetary terms as long as this is part of a well-designed and applied assessment methodology.

Further research is needed to reach agreement on a means by which social impacts could be converted to a scale or measure that is more comparable with other economic impact measures, such as spending by international and interstate visitors.

Whether it is feasible to develop an overall index covering the 3 dimensions of economic, social and environmental impacts, significant issues need to be addressed. These include the difficulties in consolidating such disparate measures and how the various dimensions might be weighted given the different types of events and differing stated objectives, such as economic return versus community development.

Recommendation

7.3 That a lead agency be nominated to work in consultation with key agencies including VMEC to establish a program to progressively implement, as practicable, the assessment of social and environmental impacts of major events.

[9] M Raybould, L Fredline, L Jago and M Deery, Triple Bottom Line Event Evaluation: A Proposed Framework for Holistic Event Evaluation, Proceedings of the Third International Event Conference, The Impacts of Events: Triple Bottom Line Evaluation and Event Legacies, UTS, Sydney, July 2005, pp. 2-15.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 7.3

Triple bottom line assessment is agreed to be of value to evaluation. The Auditor-General's acknowledgment that there is currently no uniformly agreed approach is noted and DIIRD will continue to work within this constraint to research and develop an approach to this form of evaluation (recommendation 6.2 also refers).

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 7.3

VMEC supports the implementation of a practicable and cost effective triple bottom line assessments and has for some time promoted the value this would bring to the evaluation process. Since its inception in 2000, the current MEAS framework has required that social and environmental factors are considered in addition to economic impact benefits.

A significant amount of work has been undertaken in Australia and overseas to create a workable model, however as noted by the Auditor-General there is currently no uniformly agreed approach. VMEC supports the implementation of a practicable and cost effective triple bottom line assessment.

7.6 Increasing the public reporting of outcomes from major events

Information in the public domain on the economic effects of major events has generally related to the provision of the broad headline indicator.

The audit noted that the economic impact assessment report on the Dutch Masters commented that "The report should not be provided to any other person other than representatives of the Victorian Major Events Company, National Gallery of Victoria, Art Exhibitions Australia or Arts Victoria without written consent". Similar comments were also made in the economic impact assessment report of Sail Melbourne[10]. The Australian Grand Prix Corporation has advised that the report on the economic impact evaluation of the grand prix is available to the public on request.

There does not appear to be any formal government position on the release of economic impact assessments, however, the current practice is that these assessments are not publicly available. This is consistent with the position adopted by other states and territories. Such a level of confidentiality might be due to the concern that disclosure of the level of government funding for a major event may encourage other states to outbid the host state, thereby driving up the cost of staging major events.

On the other hand, given that significant levels of public funds are involved, there is a strong argument for increased public disclosure in the interests of transparency and accountability.

There would be merit in developing a publicly available reporting template covering information such as the number of international and interstate attendees at a major event and their accompanying expenditure profiles.

Recommendation

7.4 That a reporting template be developed to better facilitate the public reporting of key outcomes from major events to increase transparency and accountability for the use of public funds.

[10] Ernst and Young, *Melbourne Winter Masterpieces: Dutch Masters Economic Impact Assessment,* a report for the Victorian Major Events Company, Arts Victoria, Art Exhibitions Australia and the National Gallery of Victoria, 6 October 2005; and Ernst and Young, S*ail Melbourne 2006 - Economic Impact and Regional Expenditure Assessment*, a report for the Victorian Yachting Council, March 2006.

RESPONSE provided by the Acting Secretary, Department of Innovation, Industry and Regional Development

Recommendation 7.4

The benefits of major events are currently widely reported via media releases and Departmental and agency annual reports. Improvement options including the development of a template, for this public reporting will be considered as part of the ongoing reporting process. Account will necessarily be made of the extent to which details relating to the funding arrangements of specific events are required to remain confidential.

RESPONSE provided by the Chief Executive Officer, Victorian Major Events Company

Recommendation 7.4

VMEC will consult with relevant Government Departments regarding the likely development of a reporting template. VMEC notes that in any public reporting, the "commercial-in-confidence" nature of many of the major event agreements also needs to be considered.

Appendix A. Conduct of the audit

Methodology

The audit was performed in accordance with the Australian auditing standards applicable to performance audits and accordingly included such tests and procedures considered necessary.

Cost

The cost of the audit was $700 000. This includes direct staff time, contractor costs and printing as well as the full recovery of overheads.

Assistance to the Audit team

In addition to the contractors listed in Part 3 of this report and agencies involved in this audit, we wish to acknowledge the organisations which provided their calculations and estimates of non-recoverable costs as part of our cost benefit analysis of the 2005 Formula 1 Grand Prix. These organisations were:

- Transport Accident Commission
- City Of Melbourne
- Metropolitan Fire Brigade
- Department of Infrastructure
- St John Ambulance
- State Emergency Service
- Victoria Police
- Parks Victoria
- VicRoads.

Glossary of terms

Business surplus

The surplus to business arising from the difference between the cost of expanded output and its sale value.

Consumer surplus

The benefit to consumers over and above the price they pay for a good.

Cost-benefit analysis

A cost-benefit study estimates the sum of costs and benefits of a policy or event for a particular community.

Economic impact study

An economic impact study estimates the impact of a policy or event on the gross output produced by a specific economy, such as a state economy.

Economic profit

A firm's profit after all costs have been accounted for, including the cost of equity finance.

Labour surplus

The surplus to labour over and above the minimum payment required to compensate the labour for the work undertaken.

Non-use values

These are values that households may attach to a good when they do not actually use it or consume it in some way.

Opportunity cost

The value of resources employed in their most productive alternative use.

Price discrimination

Identifying classes of consumers by their willingness to pay and charging accordingly.

Sensitivity testing

Determining whether the estimated outcome is sensitive to a plausible change in value of any determining variable.

Third parties

Firms or households that are affected by the production of a good or service who are not themselves consumers or producers of that good or service.

Welfare effects

Any costs or benefits experienced by a member of the relevant community – in this case, the Victorian community.

Commissioned studies: 2005 Australian Formula 1 Grand Prix

Introduction to commissioned studies

To provide an independent assessment of the economic value derived from the 2005 Formula 1 Grand Prix and to assist agencies in the selection and application of methodologies for evaluating major events, the Victorian Auditor General's Office commissioned 2 studies of the 2005 event. This involved:

- conducting a cost benefit analysis (CBA) to estimate the level of net benefit to Victorians
- the application of computable general equilibrium (CGE) modelling to ascertain economic effects such as the increase in Victoria's Gross State Product.

The studies provide an example of the application of sound economic assessment principles. However, the assumptions made within both the CBA and CGE studies were developed based on the particular circumstances of the 2005 event. Subsequent evaluations using similar approaches for other events should tailor any assumptions to the particular purpose, nature and type of event.

The results of these commissioned studies are subject to important caveats. These are listed in the introduction to each study. Also, because both CBA and CGE are quite different in their purpose, method and application, the results of these studies are not directly comparable to each other. Care therefore needs to be taken in interpreting the results.

A Commissioned study: Cost-benefit analysis

A1. Executive summary

A1.1 Introduction

The Victorian Auditor General's Office (VAGO) commissioned Applied Economics to conduct a cost benefit analysis (CBA) of the 2005 Australian Formula 1 Grand Prix. VAGO, as part of its oversight of this study, was advised by Dr Frank Harman and a technical advisory committee consisting of Professor Harry Clarke (Head of Department of Economics and Finance, Latrobe University) and Professor Leo Jago (Deputy CEO and Director of Research, Sustainable Tourism CRC, Victoria University).

About the Australian Formula 1 Grand Prix.

The grand prix comprises 4 days of events from Thursday, 3 March, to Sunday, 6 March in Albert Park, Melbourne, as well as related civic events, mainly in the Melbourne central business district (CBD). Thursday and Friday are practice days for F1 cars, along with some other motor vehicle events. Saturday includes F1 practice, a V8 race, and F1 qualifying circuits. On Sunday, there is entertainment from early in the day followed by the grand prix race in the afternoon.

Related events in 2005 were a parade of F1 cars in the city associated with the 10th anniversary of the event and a live site in Federation Square in the centre of the CBD where several thousand spectators followed each of the main events at Albert Park.

The rationale for selection of the 2005 event

This study provides a cost-benefit analysis (CBA) of the program of events that together made up the grand prix week in 2005. We chose the 2005 event for 2 reasons:

- The National Institute of Economic and Industry Research (NIEIR) prepared an economic impact evaluation of the 2005 event, which provides estimates of attendance and expenditure at the grand prix that are relevant to this CBA[1].

[1] National Institute for Economic and Industry Research (NIEIR), *Economic Evaluation of the 2005 Foster's Australian Grand Prix,* a report prepared for the Australian Grand Prix Corporation, Melbourne, 2005.

- No extraordinary events in 2005 could distort the outcomes. In 2006, Melbourne hosted the Commonwealth Games shortly before the grand prix.

Quality of data

The quality of available data about the Australian Formula 1 Grand Prix is variable. Most costs and benefits can be quantified with a high degree of reliability, whereas precise quantification of others is more problematic and estimates were required. Approximately 98 per cent of costs and 83 per cent of benefits within the CBA come with a high degree of reliability.

In assessing the net benefit from the 2005 Australian Formula 1 Grand Prix where reliable information was not available, best estimates and proxies were used as a substitute. These have been clearly indicated in this study. Where there were uncertainties about the data for material items such as business, labour and consumer surpluses, a sensitivity analysis was undertaken to determine the degree to which the outcomes from the analysis were affected by these inputs. The results of the CBA have been reported both as a best estimate and within a value range and, based on the advice of the technical advisory committee, these results are highly plausible.

Results of study

With the level of uncertainty in measuring certain material social benefits, the CBA estimated that costs could exceed benefits by between $0.8 million and $13.2 million, however, according to the study's best estimate, costs exceeded benefits by $6.7 million.

A1.2 Conclusions

Costs

The social cost of producing the 2005 event is estimated at $69.8 million (Figure A1).

The Australian Grand Prix Corporation (AGPC) incurred costs of $68.1 million to construct and run the event and these costs constitute 98 per cent of the total estimated costs.

Figure A1 also shows the best estimates of the community costs due to government agency costs, loss of park uses and amenity, traffic diversion and congestion, and noise. These amount to an estimated $1.7 million and are significant locally, but are only 2 per cent of the total estimated cost.

Overall the cost estimates come with a high level of reliability.

Figure A1
Estimates of costs to Victoria from the cost-benefit analysis

Costs	$m	Data source
Costs with a high degree of reliability -		
GP construction and operation costs *(a)*	68.1	From AGPC accounts.
Total of costs with a high degree of reliability	**68.1**	
Costs based on best estimates -		
Other GP-related government costs	0.5	Information from other agencies.
Loss of park uses and amenity	0.4	Research by Lansdell and Gangadharan (2003) on the informal recreational value of Albert Park using the travel cost method.
Transport congestion	0.5	VicRoads and Austroads (2005) for estimates of travel time costs.
Noise costs	0.2	Port Phillip Council, Doctors working group (1994), and estimates of impact of noise on property values in Boardman et al. (2006).
Total of costs based on best estimates	**1.7**	(Actual dollar totals in Figures A10 and A11 result in a rounding up to $1.7 million).
Total costs based on the most reliable data and best estimates	**69.8**	

(a) Expense borne by the Australian Grand Prix Corporation less depreciation expenses.

Source: Commissioned study.

Benefits

Figure A2 shows the benefits of the grand prix to be estimated at $63.1 million. This figure includes the most reliable data ($52.4 million) as well as benefits based on best estimates ($10.7 million).

Figure A2
Estimates of benefits to Victoria from the cost-benefit analysis

Benefits	$m	Source
Benefits with a high degree of reliability		
Visitor payments to AGPC	41.5	From AGPC accounts.
Sponsor payments to AGPC	10.9	From AGPC accounts.
Total of benefits with a high degree of reliability	**52.4**	
Benefits based on best estimates -		
consumer surpluses accruing to Victorian visitors	3.4	Assumed central case that consumer surplus was 10.8 per cent of ticket sales to Victorians. Impact of sensitivity analysis for higher and lower values is set out in Figure A4.
Other consumer benefits to Victorians	1.9	Assumes $10 consumer surplus for each of 190 000 residents of Victoria who participate in off-track events. (This mainly related to a one-off event to celebrate the 10th anniversary of the GP).
Business surplus accruing to Victorian businesses during GP	3.7	Assumed a business surplus of 13.5 per cent of international and interstate expenditure other than GP tickets based on Dwyer et al. (2005) and adjusted for crowding out.
Labour surplus	1.7	Based on Dwyer et al. (2005) and assuming that 3 per cent of the expenditure derived from international and interstate visitors other than GP tickets is a surplus, adjusted for crowding out.
Total benefits based on best estimates	**10.7**	
Total benefits based on most reliable data and best estimates (52.4+10.7)	**63.1**	

Source: Commissioned study.

Net benefit

Figure A3 shows the net benefits (benefits less costs) based on the data used in Figure A1 and A2.

Figure A3
Net benefits using the most reliable data and best estimates

	($m)
Net benefits (benefits-costs) based on the most reliable data for benefits and costs (52.4 – 68.1)	-15.7
Net benefits based on best estimates for additional benefits and costs (10.7-1.7)	9.0
Overall net benefit using the most reliable data and best estimates for benefits and costs (63.1– 69.8)	-6.7

Source: Commissioned study.

Figure A3 shows how, if only the most reliable data were used, the net benefit of the grand prix would amount to $-15.7 million. However, a CBA incorporates broader benefits and costs than those identified in the most reliable data. These wider benefits potentially include benefits to Victorian residents over and above what they pay to enjoy the grand prix (consumer surpluses) and business and labour surpluses that may result from the extra demand arising from international and interstate visitors.

These broader benefits are more difficult to measure than the benefits and costs accruing to, and paid for by, the AGPC, but there are well established techniques for estimating monetary values in such cases, and they have been applied in this study.

The main broader benefits that were estimated are business surpluses to Victorian firms ($3.7 million) and surpluses to Victorian labour ($1.7 million). Other estimated benefits were Victorian consumer surpluses from attendance at the event ($3.4 million) and consumer benefits to Victorians who do not actually attend the grand prix, but derive a benefit from the off-course grand prix-related activities ($1.9 million).

The uncertain costs are based on the loss of park uses and amenity, traffic diversion and congestion, and noise. These community costs are estimated to be relatively small, and total $1.7 million.

When these values, based on best estimates are taken into account, the overall net benefit of the grand prix to Victoria is estimated at $-6.7 million.

Sensitivity analysis

Given the role of these best estimates of benefits in offsetting the negative net benefit amount derived from more reliable data, we applied a sensitivity analysis to the estimates of Victorian consumer surplus and Victorian business and labour surpluses to assess whether arguable ranges of the estimates for these items would make a significant difference to the overall net benefit. Figures A4, A5 and A6 show the results in terms of the change to the net benefit when each is considered in isolation.

Figure A4 shows the sensitivity of the overall net benefit derived in Figure A3 to variations in the estimate of consumer surplus as a percentage of ticket revenues. If the percentage was increased by 2 percentage points (effectively increasing consumer surplus received by Victorians attending the grand prix), the net benefit moves to $-6.2 million. Decreasing it by 2 percentage points moves the net benefit to $-7.3 million.

Figure A4
Sensitivity analysis of consumer surplus estimates on overall net benefit

Consumer surplus as a percentage of ticket revenues		Total consumer surplus	Overall net benefit
		($m)	($m)
12.8		3.9	-6.2
10.8	(best estimate)	3.4	-6.7
8.8		2.8	-7.3
6.8		2.3	-7.8

Source: Commissioned study.

If reduced to 6.8 percent of ticket revenues as the measure of consumer surplus, in the belief that the organisers of the grand prix were able to inject considerable price discrimination into ticket pricing, the estimate of overall net benefit would fall to $-7.8 million.

Figure A5 shows the sensitivity of the overall net benefit derived in Figure A3 to variations in the estimate of business surplus as a percentage of international and interstate tourist expenditure other than on grand prix tickets. The upper level of $7.4 million in business surplus gives rise to an overall net benefit of $-3 million. This would apply if all of the extra output induced by interstate and international tourist expenditure other than on tickets for the grand prix was produced using spare capacity in the Victorian economy, so that crowding out did not apply.

Figure A5
Sensitivity analysis of business surplus estimates on overall net benefit

Business surplus as a percentage of international and interstate tourist expenditure other than grand prix tickets		Total business surplus	Overall net benefit	Crowding out assumption
		($m)	($m)	
13.5		7.4	-3.0	No crowding out
6.75	(best estimate)	3.7	-6.7	50 per cent crowding out
0		0.0	-10.4	Complete crowding out

Source: Commissioned study.

If it was assumed that complete crowding out did occur, and that the extra output would require additional capital and labour with their associated costs, then the overall net benefit falls to $-10.4 million.

Figure A6 shows the sensitivity of the overall net benefit derived in Figure A3 to variations in the estimate of labour surplus as a percentage of international and interstate tourist expenditure other than on grand prix tickets. The best estimate for labour surplus is derived from Dwyer[2] combined with the assumption of 50 per cent crowding out, so that half the extra labour required to meet the extra demand from international and interstate tourists is diverted from other uses in the Victorian economy. If it was assumed that there was no crowding out, the overall net benefit would rise to $-5 million, while with complete crowding out it falls to $-8.4 million.

Figure A6
Sensitivity analysis of labour surplus estimate on overall net benefit

Labour surplus as percentage of gross international and interstate expenditure	Labour surplus	Overall net benefit	Crowding out assumption
	($m)	($m)	
6	3.4	-5.0	No crowding out
3 (best estimate)	1.7	-6.7	50 per cent crowding out
0	0.0	-8.4	Complete crowding out

Source: Commissioned study.

The results of these sensitivity tests demonstrate that the size of the best estimate of the overall net benefit to Victoria from the grand prix ($-6.7 million) does not change significantly in the face of plausible variations in the estimates for consumer surplus, business surplus and labour surplus, and that none of the variations alone has the capability of turning the negative net benefit into a positive net benefit.

Similarly, when the most optimistic and the most pessimistic of the sensitivity outcomes for consumer surplus, business surplus and labour surplus are combined in Figure A7, the most optimistic outcome is $-800 000 and the most pessimistic outcome is $-13.2 million.

[2] L Dwyer, P Forsyth, R Spurr and T. Ho, *The Economic Impacts and Benefits of Tourism in Australia, A General Equilibrium Approach,* Technical Report, CRC for Sustainable Tourism, 2005.

Figure A7
Range of outcomes for the overall net benefit when sensitivity tests are combined

Outcome	Assumptions	Overall benefit	Net benefit (overall benefit less $69.8 million)
		($m)	($m)
Most optimistic	Consumer surplus 12.8 per cent, business and labour surpluses with no crowding out	69.0	-0.8
Central estimate	Consumer surplus 10.8 per cent, business and labour surpluses with 50 per cent crowding out	63.1	-6.7
Most pessimistic	Consumer surplus 6.8 per cent, business and labour surpluses with 100 per cent crowding out	56.6	-13.2

Source: Commissioned study.

A1.3 Preliminary points about the data

Three important preliminary points need to be made about this study:

A cost-benefit study is not an economic impact study

A cost-benefit study estimates the sum of welfare effects of a policy or event for a particular community. These welfare effects include benefits and costs experienced (a) by consumers and producers of the event(s), and (b) by other members of the community who may be neither consumers nor producers of these events but who, as third party participants, nevertheless share in the costs and benefits.

Such a study is quite different from an economic impact study that estimates the change in gross state product (GSP). An economic impact study does not include benefits to consumers nor third party effects. In addition, it estimates changes in gross output rather than the business surpluses of producers (i.e. the revenue remaining after accounting for all relevant costs including the normal rate of return on capital and land).

A Victorian study

Second, this cost-benefit study estimates the welfare effects of an event on households in Victoria. This includes costs and benefits that accrue initially to the Victorian Government or business, but ultimately rest on households in Victoria.

This study does not attempt to estimate the welfare effects for Australia, though brief comments on this are made in Section A6.

A 2005 study

This cost-benefit analysis examines holding the grand prix in 2005 rather than not holding it. The event has been held for 9 years in Melbourne prior to the 2005 event and a grand prix track exists in Albert Park.

A CBA of initiating the grand prix in Albert Park in 1996 or to continue running it from 2011 under a new contract would involve different costs and benefits. These differences are discussed in section A6.1.

Further points about methodology

A number of further points also need to be made:

- This analysis relies mainly on previously-collected data. These data were checked and were used only when they appeared reliable. Some new data were collected. However, major new data collection was beyond the scope of this exercise.
- Values of costs and benefits are estimated as realistically as possible given the data sources and the estimation techniques available. Some of these values are uncertain and/or subject to a significant variance around an estimated average. However, the estimates and the assumptions behind them are transparent.

A2. The cost-benefit method and the grand prix

This section gives an overview of the CBA methodology and describes how this has been applied to the 2005 grand prix. In addition, the section identifies the relevant costs and benefits for an analysis of the 2005 grand prix.

A2.1 Welfare, efficiency and distributional effects

A CBA attempts to estimate the welfare effects of a policy or project on a community in dollar units.

A welfare effect is simply any cost or benefit experienced by a member of the relevant community – in this case, the Victorian community. Community members include consumers, producers, and third parties who are not directly involved in the project or event:

- Consumers are usually willing participants and can be expected to be beneficiaries.
- Producers may make business surpluses or losses while labour, as an input to the business activity that may be stimulated by a project, may make a surplus over the wage for which they would be willing to work.
- Third parties may be the recipients of positive or negative effects that typically reflect benefits (e.g. civic pride) and costs (e.g. noise) that accrue to households not attending grand prix-related events.

Such a welfare (cost-benefit) analysis is quite different from an economic impact study that attempts to estimate the effect of a project on GSP.

The aggregate result of a CBA indicates whether the estimated gains exceed the costs to the community as a whole. If the estimated net social benefit is positive, (the total benefit exceeds the total cost) then the policy or project is said to be an efficient use of society's economic resources.

Sensitivity analysis shows how robust estimates of benefits and costs are to possible changes in data or assumptions.

A2.2 Estimating costs of the 2005 grand prix

There are 3 main sets of costs of the Australian Formula 1 Grand Prix for Victorians:

- Construction and operating costs incurred by the AGPC. The AGPC is a publicly-owned corporation and manages the Australian Formula F1 Grand Prix and the MotoGP
- Grand prix-related costs incurred by other Victorian government agencies
- Costs incurred by the Victorian community, including loss of Albert Park uses and amenity, traffic diversion and congestion, and noise.

Construction and operating costs incurred by the AGPC

The AGPC incurs most of the costs of constructing and operating the grand prix circuit, and marketing and administering the grand prix. The AGPC also reimburses government agencies for most or all of their related expenses and compensates Albert Park tenants partially for their loss of income and amenity.

In general, the amount spent on producing the grand prix is the cost of resources employed and the value of other goods and services forgone. The cost of employing capital, land and labour for the event is the value of what those economic resources could have produced in their best alternative use. Unless the AGPC employs capital, land and labour that would otherwise be unemployed, the full cost of producing the event is a cost in the CBA. The same consideration applies to activities directly affected by the grand prix such as the hotel and restaurant industries.

It may be contended that production of the grand prix creates additional local employment and business income to local producers. But the same would be generally true if the government spent its subsidy amount on schools or community roads, and Victorian households spent their grand prix expenditures on other goods and services. The potential for extra employment and business income in Victoria comes from the expenditures of interstate and overseas visitors who come for the Grand Prix.

Expenditure by Victorians and the Victorian Government on the grand prix would create more local employment and business income only if it has a higher local spending content (less imports) than other public and private expenditures. There does not seem to be any reason why AGPC expenditure would generate more local employment than would an equivalent amount spent on other goods and services by Victorians and the Victorian government.

Accordingly, this CBA treats the relevant AGPC expenditures as a cost to the Victorian community and all of the capital labour and land used by the AGPC is, therefore, valued at their full opportunity cost.

Grand prix-related costs incurred by other government agencies

Similar principles apply to costs incurred by other government agencies involved in the grand prix. As noted, many agencies are reimbursed by the AGPC. To avoid double-counting, this analysis adds in only expenses that are not reimbursed.

Community costs

Community costs fall into 3 main categories:

- loss of Albert Park uses and amenity
- traffic diversion and congestion
- noise.

In each case, the valuation process requires 2 steps:

- estimating the amount of loss (of park uses and amenity, traffic diversion and congestion, and noise)
- estimating the value associated with that loss.

While some relevant data are not readily available (see section A3.3), it is possible to estimate plausible costs for each major cost category.

Loss of park uses and amenity

Estimating the amount of loss means considering 2 things: the uses that are prevented or disturbed, and the number of people whose use is prevented or disturbed. These estimates are based over a (roughly) 12-week period that includes preparing for the grand prix, the actual grand prix week, and the clean-up period.

Traffic diversion and congestion

Estimates are needed of the effect of the local road closures on traffic volumes, speeds and congestion, and the cost of the resulting extra travel time.

Noise

Estimates are needed of the amount of extra noise imposed on local residents by the construction and operation of the grand prix, and the cost of that noise.

What is excluded from community costs?

These community costs do not include trading losses of local firms as a result of the grand prix. The grand prix may cause some households to spend in different areas and so redistribute spending among traders. However, the grand prix is likely to increase local spending in Victoria because of the extra spending by interstate and overseas visitors rather than reduce it. Therefore, losses by some traders will be offset by gains to others, and net trading gains are likely.

This does not imply that switches in trading expenditure by Victorians are unimportant. However, in the terms used in economic evaluations, these switches are income distributional effects rather than efficiency effects and they are treated as a distributional issue in this report.

A2.3 Estimating benefits of the 2005 grand prix

The 4 main sets of benefits to Victorians from the grand prix are:

- visitor and sponsor payments to the AGPC
- Victorian grand prix consumer surpluses
- other consumer benefits – e.g. benefits of participating in related off-site events
- surpluses gained by Victorian businesses and labour.

Visitor and sponsor payments to the AGPC

The ticket sales and sponsor revenue received by the AGPC (exclusive of goods and services tax payments) are a benefit to the Victorian taxpayer in that they offset the costs incurred in staging the grand prix, and reduce the size of the Victorian Government subsidy to the grand prix.

Victorian grand prix consumer benefits

In cost-benefit evaluations, the gross consumer benefit of a good or service is typically valued at the maximum amount that consumers are willing to pay for it[3]. This willingness-to-pay amount represents the value of goods and services that consumers are willing to forgo for this experience.

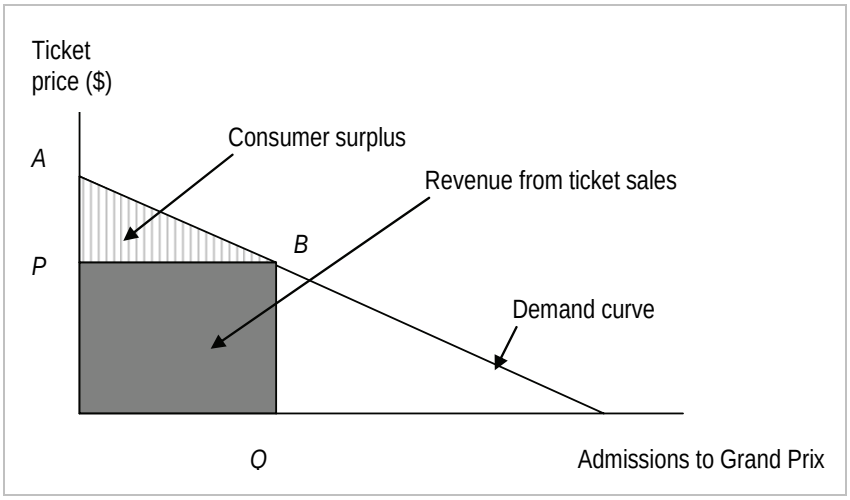
Ticket prices may not reflect the maximum that many consumers may be willing to pay for a good or service. The practice of ticket scalping is an indication that people are often willing to pay more than the official ticket price, and that consumer surplus exists.

Understanding consumer surplus

The difference between what consumers are willing to pay for something and the price they actually pay is known as consumer surplus. This is demonstrated in Figure A8.

[3] Department of Finance, *Handbook of Cost-Benefit Analysis,* Commonwealth of Australia, Canberra, 2006, p.10.

Figure A8
Consumer surplus



Note: Shows a linear demand curve for grand prix admissions, with admissions increasing as price falls. At ticket price P, there would be Q admissions, generating PQ revenue. The area ABP represents consumer surplus. This surplus can be estimated with information or assumptions about shape of the demand curve. (Assumptions and estimates of Victorian consumer surplus are discussed in section A4.3.)

Source: Commissioned study.

The surplus shown in Figure A8 allows for any loss of surplus on other goods that are no longer purchased. This is implicit in the demand curve. The demand curve shows what individuals are willing to pay for the grand prix experience given the prices of other goods.

Consumer surplus is commonly estimated and included in cost-benefit studies even where services are provided free – such as road transport or health services. On the Thursday of the 2005 grand prix event, patrons were allowed into general admission areas free of charge.

The general principle also applies to one-off events like a grand prix for which prices are charged.

Other consumer benefits to Victorians

Other benefits to Victorians take the form of participation in related off-site events.

During the 2005 grand prix, most related events took place in the CBD, including the parade of F1 cars and the live site in Federation Square attended by several thousand people.

Of course, Federation Square hosts live site functions for major events outside Victoria, such as the World Cup Soccer. It is assumed, however, that the Australian F1 Grand Prix attracts large crowds because it is a Melbourne event and, hence, the Federation Square participants in the Australian F1 Grand Prix are gaining benefits because it is held in Melbourne.

Surpluses gained by Victorian businesses and labour

While consumer surplus is an important ingredient of the benefits taken into account in CBA, also relevant are the counterparts to consumer surplus; that is business and labour surpluses.

The source of business surplus comes when a firm is able to expand output and the difference between the cost of the expanded output and the sale value is then the business surplus. Labour surplus occurs in the situation where labour is employed at a wage higher than what workers would be prepared to accept to enter into employment.

In both cases, the concept of opportunity cost is crucial to defining surplus. Business surplus is the difference between the value of output and the cost of the factors of production (land labour and capital), where their cost reflects their value in alternative uses. Similarly, the surplus accruing to labour is the amount of the wage above what is necessary to induce a worker to take on an employment opportunity, which in turn is determined by the wage in alternative employment opportunities.

In the short-term, the existence of surpluses can reflect the lack of time competitive markets have to eliminate surpluses. In the long run, economic theory suggests that:

- in competitive markets earnings by labour and business are reduced by competition to their opportunity cost
- the economy will also be at full employment.

The standard procedure in CBA is to assume full employment, so that all labour, capital and land are valued at their opportunity cost. The Australian Commonwealth Government's *Handbook of Cost Benefit Analysis* states: "As a general rule, it is recommended that analysts assume that labour, as with other resources, is fully employed"[4].

This means that the cost of labour capital and land in a new activity is determined by their contribution to production in the alternative use from which they are drawn, and can be measured by their prevailing wages and return on capital and land.

For the purpose of the CBA of the grand prix, however, it was decided that because the grand prix only impacts on the Victorian economy over a relatively short period of time, it would be appropriate to incorporate estimates of labour and business surpluses for those additional activities, but not the grand prix itself, that benefit from the extra expenditure of international and interstate visitors.

In other words, no business and labour surpluses are assumed to be generated by the spending of the AGPC. This is because businesses that supply goods and services to the corporation itself are more likely to operate in a competitive market and without spare capacity.

[4] Department of Finance, *Handbook of Cost-Benefit Analysis,* Commonwealth of Australia, Canberra, 2006, p. 40.

On the other hand, businesses such as hotels and restaurants are assumed to be able to generate business and labour surpluses because of the potential for spare capacity and unemployed or underemployed workers who can be employed on a casual basis to meet the extra demand.

For example, if the Melbourne hotel and restaurant sectors were able to accommodate the extra demand created by interstate and international visitors to the grand prix without reducing their services to other customers, and without requiring additional capital and land, then those business would earn surpluses.

The extent of any surpluses accruing to Victorian businesses depends crucially on the extent to which spare capacity actually exists at the time of the grand prix. The ACT Auditor-General's Office was required to make a similar judgement over this same issue in the CBA it carried out for the V8 Car Races in 2002.

When considering an estimated 71 cents increase in the GSP of the ACT for each dollar of tourist expenditure, the ACT Auditor-General's Office wrote that: "The estimates by the Chief Minister's Department and the Centre for Tourism Research (71c) both assume there are no resource constraints in the economy. Further, the increase in GSP represents the benefit to the ACT only if resources used to produce the goods that tourists buy have no alternative use. As these assumptions are unrealistic, the 71c estimate is an upper bound to the benefits from the increase in tourist spending"[5].

The report further stated that: "The net benefit from $1 of tourist spending will lie somewhere between zero and 0.71…There may be idle resources but the zero opportunity cost case is unrealistic"[6].

In the light of the position adopted by the ACT Auditor-General's Office and other plausible assumptions, it is possible (see section A4.5) to make a realistic estimate of the surpluses that may be gained by Victorian business and labour from international and interstate visitors to the grand prix.

A2.4 Aggregation of costs and benefits

All of the benefits and costs we have described in sections A2.2 and A2.3 are valued in this study in the same unit of value, namely 2005 dollars. This means that they can be aggregated into a summary value. This summary value is the net social value, which is the sum of benefits to producers, consumers, and third parties less the costs to producers, consumers, and third parties.

[5] ACT Auditor-General's Office, *V8 Car Races in Canberra – Costs and Benefits*, Performance Audit Review, Canberra, 2002, p. 20.

[6] Ibid. p.86.

In this case, the producer of the grand prix is the Victorian Government. The relevant consumers are Victorian households. The third parties are Victorian businesses or households that experience benefits or costs flowing from the event.

These component effects can be summarised as follows:

- **Victorian Government**: AGPC grand prix expenditures less receipts plus other government costs not paid for by the AGPC
- **Victorian consumers**: surpluses from attending the grand prix
- **Third party business and labour effects**: the increase in business surpluses of Victorian firms accruing ultimately to Victorian households and labour surpluses accruing to Victorian workers.
- **Third party household effects**: these include benefits enjoyed by Victorian households from grand prix-related events and the costs to the community associated with loss of park uses and amenity, traffic diversion and congestion, and noise.

Ongoing effects on the Victorian economy

In this analysis, all costs and benefits are assumed to occur within 12 months. It is assumed – in our view realistically – that the holding of the 2005 grand prix had no effect on the Victorian economy from year 2006 onward. Although most costs are incurred before the benefits are experienced, the time gap is small and interest cost and time discounting are not considered necessary for this study.

A3. Costs of the 2005 grand prix

This section reports the estimated major costs of the 2005 Grand Prix against 3 main categories:

- Australian Grand Prix Corporation (AGPC) construction and operating costs
- other government costs
- community costs, including
  - loss of Park uses and amenity
  - traffic diversion and congestion
  - noise.

A3.1 AGPC construction and operating costs

Figure A9 shows that the AGPC's operating expenses totalled $70.1 million in relation to the 2005 F1 grand prix.

However, these expenses include an allowance of $2 million for depreciation, including $1.7 million for depreciation of infrastructure and $300 000 for furniture, fittings and equipment. Generally, capital expenditure is included in a CBA, but depreciation is not as this would involve double counting.

The estimated resource cost of producing the 2005 event was, therefore, $68.1 million. This expenditure on resources could have produced other goods and services for the Victorian community.

Figure A9
2005 Australian Formula 1 Grand Prix expenses

AGPC activity	$m
Event management and staging	32.3
Recurrent engineering *(a)*	22.4
Marketing/promotion and catering	9.1
Administration	6.3
Total operating expenses	**70.1**
Less depreciation	**2.0**
Total expenses less depreciation	**68.1**

(a) Costs associated with assembling, dismantling and servicing of 2005 grand prix.

Source: AGPC, *Annual Report, 2005.*

Included and excluded costs

In this analysis of the holding of the 2005 event, depreciation of capital acquired in earlier years is relevant only if it reflects depreciation due to use of the physical capital. However, the figures for depreciation appear to be accounting measures to spread the capital expenditure over the life of the capital rather than to reflect any real resource cost in 2005. Depreciation is, therefore, excluded from this analysis.

The expenses include payments to other organisations by AGPC, namely, Parks Victoria, VicRoads, the Department of Infrastructure, Victoria Police, the City of Melbourne, the City of Port Phillip, and St John Ambulance.

The costs also include compensation for loss of income of tenants of Albert Park who held a lease with Parks Victoria before the first event in the park in 1996. The tenants are compensated (partially at least) for loss of income based on a formula in s.30 (5) of the *Australian Grand Prix Act 1994*. Also, some recreational clubs receive minor compensation in the form of a few general admission season tickets. However, this compensation is a small part of the overall cost associated with the takeover of the park before, during and after the grand prix.

The expenses include some imputed costs that are not actually incurred. For example, Qantas provides some free flights and a local radio station provides advertising. However, we understand that the AGPC records these imputed costs as expenses in the accounts along with an offset revenue figure under sponsorship income (so there is no net cost).

In 2005, the AGPC spent $2.85 million in capital works for the 2006 grand prix. The AGPC also spent $3.4 million in 2004 for the 2005 MotoGP. However, the AGPC did not spend anything in 2004 for the 2005 Australian F1 Grand Prix, therefore, we do not include capital works expenditures in our analysis.

A3.2 Other government costs

For this study, major agencies known to provide any significant services to the AGPC were contacted to determine whether AGPC reimbursements adequately reflected their costs.

Figure A10 lists the agencies that reported significant net expenses directly associated with the grand prix and after receipt of any reimbursements from the AGPC. The total amounts to $496 544.

Figure A10
Agencies reporting significant NET expenses in excess of recoverable amounts from the AGPC

Agency	($)
Transport Accident Commission	2 800
City of Melbourne	126 341
Metropolitan Fire Brigade	119 229
Department of Infrastructure	88 080
St John Ambulance	46 671
State Emergency Service	18 414
Victoria Police	58 889
Parks Victoria	31 995
VicRoads	4 125
Total	**$496 544**

Source: Commissioned study.

In 2005, the Melbourne City Council spent a total of $283 616 in relation to the grand prix, including $125 000 to sponsor a city parade of F1 motor vehicles. This was a one-off expense to celebrate the 10th anniversary of the race in Melbourne. The council received $157 275 from the AGPC, thus incurring a deficit of $126 341.

The AGPC reimbursed $528 556 to the Department of Infrastructure for the free travel expenses provided to the visitors to the grand prix. The department had an unreimbursed expenditure of $88 080 mainly for the provision of transport guides to visitors.

The City of Port Phillip, the local government jurisdiction within which the grand prix occurs, advised that total revenue raised from various revenue generating activities associated with the grand prix, including reimbursement from the AGPC, offset expenditures by the city that were associated with the event.

The State Emergency Services, unlike other organisations such as the Metropolitan Ambulance Service, does not recover any costs from the AGPC in terms of its involvement in the grand prix. The costs in Figure A10 include staff time directly associated with planning and operational activities involving the 2005 event. Volunteers, who generally take leave from their employment to provide services at the event, are not included in these costs. While there would be a cost to the community through their involvement in the event in terms of lost production, it is not possible to provide any reliable cost estimates.

A3.3 Community costs

As Figure A11 shows, we estimate the total community cost of holding the 2005 grand prix to be $1 178 038.

Figure A11
Estimated community costs of the 2005 grand prix

	($)
Loss of park uses and amenity	440 895
Traffic diversion and congestion	500 000
Noise	237 143
Total community cost	**1 178 038**

Source: Commissioned study.

The numbers in Figure A11 are the best estimates of these costs. Given that they are borne predominantly by the local community around Albert Park they are a significant amount.

They are, however, small relative to the other costs of producing the grand prix. Thus, if they were twice as high, or half as high, as estimated here, they would have limited effect on the overall outcome of a CBA for Victoria.

The following outlines in detail how these estimates were derived.

Loss of park uses and amenity

According to a paper by Lansdell and Gangadharan, 3 million visits are made to Albert Park each year, including 1.3 million visits for sporting purposes and 1.7 million visits for informal recreational use[7]. This represents an average of 6 000 visits each week over the year. However, about 15 per cent of these visits are by interstate or international visitors. This means about 5 100 Victorians visit the park each week[8].

[7] N Lansdell, and L Gangadharan, "Comparing Travel Cost Models and the Precision of their Consumer Surplus Estimates: Albert Park and Maroondah Reservoir", *Australian Economic Papers*, 42, n4, p.407.

[8] Correspondence from Parks Victoria, which also confirmed the Lansdell and Gangadharan figures of visitors.

The *Australian Grand Prix Act 1994* allows the Albert Park Reserve to be closed partially to the public for 17 weeks from December to April to accommodate the set-up and take-down of race infrastructure. The Act also allows the Albert Park Reserve to be closed totally for the race week. In practice, the event requires about 12 weeks: 7 weeks for construction, one week for the races, and 4 weeks for dismantling.

Views on the impact on Albert Park Reserve

Views differ about the grand prix's impact on use of the park.

In a meeting on 14 August 2006, the AGPC advised that the event involved closure of about a dozen ovals for 4 to 6 weeks and the golf course for 3 weeks. Also, the Melbourne Sports and Aquatic Centre and the tennis and bowling clubs are closed for the grand prix week.

Parks Victoria pointed out that the grand prix takes place between the cricket and football seasons so that the inconvenience for sporting groups is not severe. Arrangements are made for football clubs using the Albert Park ovals to play away matches early in the season.

On the other hand, the Save Albert Park Group states that 19 sports fields or ovals are unplayable for between 4 weeks and 4 months, with an average unplayable period of about 9 weeks[9]. In addition, the Black Duck, Coot and Pelican picnic areas are described as unusable for about 6 weeks and the golf course is closed for 5 weeks. These impacts are shown in Figure A12.

[9] *Save Albert Park Group newsletter*, April 2003

Figure A12
Impacts of grand prix on Albert Park use

Sporting areas *(a)*	FI use	Period unplayable
Oval 2	Helipad	4-5 weeks
Sports fields 4, 5 and 6	Vehicle parking	4-6 weeks
Sports fields 7, 8	Renovations	6 months
Oval 9	Prost stand	8-9 weeks
Sports field 10	Schumacher stand	12 weeks
Oval 11	Senna stand, bars, restaurants	8-9 weeks
Oval 12	Grass run-off, corporate boxes	12 weeks
Oval 13	Race teams area	12 weeks
Sports fields 14, 15, 18, 19	Bars and restaurants	11-12 weeks
Field 16 west	Corporate huts; tents	12 weeks
Oval 17	Brabham stand; race teams area	3 months
Oval 20	Garage compounds	3-4 months
Oval 21	Skybox stand, gravel run-off	3-4 months
Other recreational areas	**FI Use**	**Impact**
Coot picnic area (West)	Corporate accommodation	Compromised 8 weeks
Pelican picnic area (East)	Corporate boxes	Unusable 4-6 weeks
Picnic areas (West)	Fences	Compromised 6 weeks
Black Duck picnic area	Corporate boxes, gravel run-off	Unusable 5 weeks
Golf course	Event exhibitions	Closed 5 weeks
Melbourne Sports and Aquatic Centre	GP event	Closed 1 week
Tennis and bowling clubs	GP event	Closed 1 week
Golf driving range	GP event	Closed 1 week
Open parkland	Competitor and media parking	Closed 1 week

(a) Terms as employed by Save Albert Park Group.

Source: Save Albert Park newsletter, April 2003.

A compromise estimate of lost uses

Because it is difficult to establish how accurate these rival estimates are, we have adopted a compromise estimate. We assume that all uses of the park are lost for 2 weeks and that half of all uses of the park are lost for a further 6 weeks. The effect of losing half of the park uses is twofold. First, with only half of the park uses available for 6 weeks it is assumed that the number of visitors in that 6 weeks falls by half to 2 550 a week. The total number of visits is then assumed to fall by 25 500 (5 100 times 2 plus 6 times 2 550).

Just over 40 per cent of the uses deterred or compromised would be sporting uses and nearly 60 per cent would be informal recreation uses (based on the overall proportions of sporting and informal users).

In the 6 weeks the park is still visited by 2 550 persons a week (a total of 15 300 visits) and with half uses available, it is assumed these visitors experience only half the amenity value of the park. The quality of park amenity is severely disturbed by heavy construction work and by trucking an estimated 40 000 tonnes of material in and out of the site as well as by the presence of the grand prix facilities themselves.

As we noted earlier, the AGPC provides some compensation to local traders and local sporting clubs. It reaches a separate agreement with the golf course and driving range based on loss of profit. However, the compensation for the sporting clubs (admission tickets to the grand prix with a face value of up to $5 000 per club) appears low compared with the number of persons experiencing the inconvenience and loss of use. In any case, these tickets do not compensate park users who are not interested in the grand prix.

Applying the travel cost method

Lansdell and Gangadharan[10] have done a major research study on the informal recreational value of Albert Park. They used the travel cost method to infer the surplus value that each user derived from use of the park. Using this method, researchers survey a sample of users of a park to determine user rates in relation to travel costs. Those who travel a long way have high travel costs and, hence, very little surplus value from using the park. Those who have low travel costs have higher surplus value.

The authors obtained a range of results from their detailed study. Their central estimate is that the 1.7 million informal recreation users obtain an annual value of $22.7 million from use of the park. Sporting users were not included in the analysis partly because they already pay for use (although they may still have significant surplus).

The Lansdell and Gangadharan results imply an average value of $13.30 per park user. This average value is low compared with an average value of $33 found in a survey of 200 recreational (travel-cost) studies in the United States 10 years earlier[11]. However, the American study generated values above $33 for recreations in exotic locations and below it for more mundane activities like picnics.

In estimating the value of lost uses and amenity in Albert Park, audit adopted the Lansdell and Gangadharan figure of $13.30 for lost uses and an amount of half this for reduced amenity.

Total cost due to loss of park uses and amenity

Accordingly, our central estimate is that as a result of the grand prix there is a community cost due to both the loss of use and the loss of amenity in Albert Park.

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[10] N Lansdell, and L Gangadharan, op. cit., pp. 399-417.

[11] R Walsh, D.H Johnson, and J McKean, “Benefit transfer of outdoor recreation demand studies, 1968-1988”, *Water Resources Research*, 1992., 28, n.3.

The loss of use is derived from 25 500 visits lost multiplied by $13.30 to give a total of $339 150. The loss of amenity is derived by multiplying the 15 300 visitors with reduced amenity by $6.65 to give a total loss of amenity of $101 745. The combined loss of use and amenity is then $440 895.

Traffic diversion and congestion

Although the road restrictions due to the grand prix are known, there appears to have been little analysis of the effects of these restrictions on traffic flows.

Traffic diversion

The major traffic restrictions are as follows:

- Lakeside Drive is closed in off-peak periods for several weeks before and after the grand prix event to facilitate construction and demounting. Lakeside Drive is closed completely for the week of the grand prix event.
- A Queens Road kerbside lane leading to Lakeside Drive is closed for 4 weeks before the event.
- In Aughtie Drive, stop-go traffic controllers control traffic for 7 weeks before the event. Aughtie Drive is closed completely for the grand prix.
- Queens Road is closed one Sunday night early in the construction process to allow an overpass to Gate 8 at Roy Street to be built.
- On the Saturday and Sunday of the grand prix event, there are numerous local road restrictions.

These restrictions are documented in a Traffic and Transport Plan[12].

Traffic congestion

VicRoads advised that Lakeside Drive carries about 15 000 vehicles a day in both directions, including 6 000 in off-peak hours.

On the other hand, Queens Road carries 84 000 vehicles a day, including about 4 500 vehicles each way in peak hours. VicRoads estimated that, in the race week, peak hour restrictions on Lakeside Drive add 500 vehicles per peak hour to Queens Road. Queens Road has 6 lanes between Union Street and Link Road and 5 lanes (with one lane contra flow) between Link Road and Kings Way.

There have been no travel time runs during the event. VicRoads and the Coordinator for Sustainable Traffic at the City of Port Phillip agree that there is generally only light traffic congestion on Queens Road or on the road network within the St Kilda/Albert Park precinct during the event week. Also, the off-peak traffic restrictions in the park before race week appear to have only minor delay effects.

[12] Australian Grand Prix Corporation, Traffic and Transport Plan, 2005.

However, some delays occur at intersections with Lorne Street and Link Road during and outside the race week. Also, it appears that Queen's Road is often blocked back to St Kilda Road South.

One reason cited for the low level of traffic congestion is that local residents are aware of the traffic restrictions and either restrict their trips at critical times or travel to other destinations. However, such changes in behaviour reflect second-best choices and are not without cost.

NIEIR reported that most residents were able to shop with only minor inconvenience and estimated that the cost of using alternative routes was $130 000[13]. NIEIR estimated that, of the 63 000 local residents, 3 000 experienced shopping inconvenience in the week of the grand prix and 2 000 experienced inconvenience in the week after.

Their cost estimate also allowed for 4 shopping trips per week taking an extra 30 minutes per trip (partly because of use of public transport) and a cost of $11 per hour. However, this estimate does not allow for non-shopping trips, makes no allowance for costs of deterred trips, and does not allow for any congestion effects on other users of the network.

Total costs of traffic diversion and congestion

Estimates of transport costs due to the grand prix are hampered by a paucity of data on the effects.

However, using a cost parameter based on Austroads[14] we can give some indicative costs.

In the grand prix week, about 15 000 vehicles are diverted out of the park each day for 7 days. We allow that:

- this creates extra congestion for another 15 000 vehicles on the network
- each vehicle takes an additional 3 minutes
- travel time cost is $22 per vehicle hour ($0.37 per minute)
- each vehicle may carry more than one person
- vehicles can be used for business travel as well as leisure travel.

Based on these assumptions and cost parameters, congestion cost for the grand prix week would be $233 100.

However, given that there is also some diversion and congestion cost in non-peak hours in the 4 weeks leading up to the event week and one week after, the total congestion cost could be double this, in the order of $500 000.

[13] National Institute for Economic and Industry Research (NIEIR), op. cit., p.44.

[14] Austroads, *Updates for Road User Costs (RUC) Unit Values for June 2005*

Noise

Under the Australian Grand Prix Act, the grand prix event is exempt from normal noise regulations. This does not mean that noise has no cost to local residents.

We have not found any recent documentation of the noise effects of the grand prix and, therefore, draw on Vipac Engineers and Scientists[15], which estimated noise impacts based on noise simulations and experience of the grand prix (then held in Adelaide).

Noise levels

Advice from the City of Port Phillip is that the general pattern of noise contours estimated by Vipac remains accurate, subject to wind variations. If the wind blows from the south, as it sometimes does, more residents would be affected in the north and fewer in the south. But total households affected would be similar.

Figures A13 and A14 show the noise levels associated with the grand prix, based on Vipac[16] and as reported by the Doctors Working Group[17].

Figure A13
Estimated noise levels: Racing events

	During grand prix			During other racing events	
Trackside		100 metres	200 metres	100 metres	200 metres
Maximum noise	125 dB(A)	105 dB(A)	101 dB(A)	91.5 dB(A)	91.5 dB(A)
High 5-minute average		95 dB(A)	93 dB(A)	85 dB(A)	83 dB(A)

Source: Vipac, 1994; Doctors Working Group, 1994.

Figure A14
Estimated noise levels: Locations

	Albert Road	Queens Road	Canterbury Road
Hourly daytime average	60.5–64 dB(A)	70–72 dB(A)	70–72 dB(A)
Maximum fairly continuous hourly noise	76–89 dB(A)	80–90.5 dB(A)	83.5–90 dB(A)

Source: Vipac, 1994; Doctors Working Group, 1994.

In addition to the actual race events, noise is created by:

- semi-trailers that bring in an estimated 40 000 tonnes of infrastructure (for grandstands, corporate boxes and concrete barriers)
- traffic coming and going to the event
- helicopters.

[15] Vipac Engineers and Scientists, *Albert Park Grand Prix Noise Study,* prepared for City of Port Phillip, Melbourne, 1994.

[16] Ibid.

[17] Doctors Working Group, *Health Impacts of the Proposed Albert Park Grand Prix,* 1994.

Noise impacts on residents

As an indication of noise impacts, noise levels:

- interfere with sleep and studying at levels above 50 dB(A)
- interfere with communications above 65 dB(A)
- are generally regarded as annoying at above 70 dB(A)
- are generally regarded as intolerable at above 80 dB(A)
- may raise pulse and blood pressure at above 80 dB(A)
- may cause hearing damage at about 115 dB(A).

In practice, noise annoyance depends on attitudes to the noise source. Some people enjoy loud music, for example. Health effects depend on vulnerability. All effects depend on the noise duration.

Correspondence from the City of Port Phillip indicates that about 7 000 people (or 2 500 households) reside within the 80 dB(A) line for the grand prix and that a fair number of these reside within the 90 dB(A) line. The Doctors Working Group[18] reported that about 30 000 people resided within one kilometre of the track at the time of the 1991 census. Allowing for population growth, this implies about 12 500 households today.

The Doctors Working Group also noted that Alfred Hospital wards are within 500 to 700 metres of the track and that some 1 000 vulnerable elderly residents reside in hostels or elderly accommodation within 500 metres of the track.

For this evaluation, we assume that all 2 500 households within the 80 dB(A) zone experience high adverse noise impacts as a result of the grand prix (although some households may not view this as a problem). Of the balance of about 10 000 households in the affected area, we assume that one-third experience some annoying noise amenity costs.

Costs of noise disamenity on property values

The costs of noise disamenity can be estimated from the (negative) effects on property values. Studies of property values have shown that extreme traffic noise (for example immediately under aircraft flight paths very close to an airport) can cause property values to fall by up to 20 per cent[19].

For the grand prix, we assume that noise impacts would cause weekly rentals (actual or imputed) of the 2 500 severely-affected properties to fall by 20 per cent and the rents of the 3 300 other affected properties to fall by 10 per cent for one week.

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[18] Ibid.

[19] AE Boardman, DH Greenberg, AR Vining and DL. Weimer, *Cost-Benefit Analysis, Concepts and Practice*, 3rd edition, Pearson, New Jersey, 2006, and studies referenced within.

It may be argued that local rents would actually rise in the grand prix week despite the noise effects because of the accessibility value of local properties to visitors. This is possible for some local housing but this would represent part of the business surplus effect for local businesses (including local households) renting out accommodation and is accounted for separately in this report.

Drawing on <domain.com.au>, the average house price in the area is about $900 000 and the average unit price about $450 000. We allow an average residential price of $650 000. Allowing a 4 per cent rental return, this implies an average rental of $26 000 a year or $500 a week. Combined with the assumptions about changes in property values discussed above, the average noise disamenity cost would be $100 a week for severely-affected properties and $50 for less-affected ones. Of course, these are averages. Doubtless, some residents would be willing to pay more than $100 to avoid the noise from the grand prix; others would pay less.

Given that the grand prix extends over 4 days, and not a full week, we have allowed for this in calculations below.

Total noise costs

Total noise costs for residents would, therefore, be $237 143 for each grand prix event. This is determined by 2 500 dwellings × $100 + 10 000 dwellings × 0.33 × $50. This results a total of $415 000 which is then adjusted for the fact that the event is run over 4 days. No allowance is made for any special costs for elderly persons in old-age accommodation or for patients in the Alfred Hospital.

A4. Benefits of the 2005 grand prix

The benefits of the grand prix are mainly driven by how many spectators the event attracts. Spectators generate revenue for the AGPC and Victorians attending the event may experience some consumer surplus. International and interstate visitors to Victoria for the grand prix may also generate extra local income in excess of the costs of production. We, therefore, begin this section with an assessment of the numbers of spectators and visitors attending the 2005 grand prix event.

This section then reports the estimated major benefits of the 2005 grand prix against 4 main categories:

- visitor and sponsor payments to the AGPC
- consumer surpluses accruing to Victorians attending the grand prix
- other consumer benefits to Victorians
- benefits to Victorian businesses and Victorian labour.

A4.1 Numbers of grand prix spectators and visitors to Victoria

Attendance estimates

Figure A15 shows the AGPC's estimate of attendance figures for the 2005 grand prix.

Figure A15
AGPC's estimate of total admissions, 3–6 March 2005

Day	Admissions
Thursday, 3 March	77 400
Friday, 4 March	82 300
Saturday, 5 March	91 700
Sunday, 6 March	118 200
Total admissions over 4 days	**369 600**

Note: Figure includes 28 100 free general admissions.
Source: AGPC.

These numbers are estimates based on ticket sales, observations of the numbers of corporate and grandstand seats occupied, and observations of general admission areas. The numbers are not precise because there are no turnstiles. Also, corporate and grandstand seats are sold only as 4 days tickets, but they may not be used every day. General admission tickets are sold on a 4-day and 1-day basis, with most sold as a 1-day ticket.

Number of separate visitors

Total admissions exceed the number of separate persons attending because some people attend on more than one day, especially 4-day ticket holders.

According to NIEIR the AGPC estimates the number of separate visitors (SV) with the following formula: SV = 1.25 (A + B) + 2C + D, where

A = the number of 4-day general admission tickets
B = the number of 4-day grandstand tickets
C = the number of corporate tickets
D = the number of 1-day general admission tickets.

This formula gives a figure of 170 551 separate visitors, excluding grand prix teams and media (Figure A16).

The formula and the resulting estimate do not include the free general admissions on Thursday, 3 March 2005, which could involve up to an extra 28 100 visitors – presumably nearly all local persons.

Figure A16
Estimated numbers of separate visitors

Visitor origins	Numbers	Per cent	Came for GP	Stayed for GP
Melbourne	102 161	59.9	..	..
Other Victoria	12 281	7.2		
Interstate	32 503	19.1	19 502	1 149
International	23 606	13.8	8 262	1 309
Total	**170 551**	**100.0**	**27 764**	**2 458**

Source: National Institute of Economics and Industry Research, Economic impact evaluation of the 2005 Foster's Australian Grand Prix, August 2005

On the basis of about 2 600 interviews of attendees[20], NIEIR estimated that there were 23 606 international visitors and 32 503 interstate visitors, with the balance being Victorians (Figure A16). The fact that there were international and interstate visitors to Victoria at the time of the grand prix and attending the grand prix is not sufficient. It is necessary to know whether they were in Victoria because of the grand prix, or had extended their stay to attend the grand prix.

In total, NIEIR estimated that the event attracted 27 764 visitors to the state who would not have come otherwise and encouraged 2 548 visitors to stay longer than they otherwise would have done.

In addition, the grand prix attracted nearly 3 000 drivers, team members and officials to Melbourne and about 800 media representatives. Of these, an estimated 2 668 were from outside Victoria. Including visiting spectators (27 764), this means the event attracted an estimated 30 432 interstate and overseas visitors.

Further to this, NIEIR[21] estimated that these extra visitors spent a total of 174 034 visitor-nights in Victoria (an average of 5.7 nights per visitor). NIEIR also estimated that the 2 458 extended-stay visitors spent an extra 20 960 nights in Victoria (an average of 8.5 days extra).

In the absence of data to the contrary, we have adopted NIEIR's estimates of international and interstate visitor and visitor nights in this report.

A4.2 Visitor and sponsor payments to AGPC

In 2005, the AGPC received $52.4 million in revenue from its commercial activities. This revenue, outlined in Figure A17, represents a benefit to the Victorian Government (or taxpayer).

[20] National Institute of Economic and Industry Research, op. cit., p. 5.

[21] National Institute of Economic and Industry Research, op. cit., p. 23.

Figure A17
Revenue received by AGPC from commercial activities

Commercial activities	$
Sales revenue	41 475 055
Sponsorship and commercial revenue	10 885 958
Other operating revenue	78 547
Total	**52 439 560**

Source: AGPC, *Annual Report 2005.*

A4.3 Victorian consumer surpluses from race attendances

As we have noted, consumer surplus is the difference between what people are willing to pay for attending the grand prix and the price that they actually pay.

When a seller tries to maximise profit and adopts price discrimination strategies (identifying classes of consumers by their willingness to pay and charging accordingly), consumer surpluses may be small. On the other hand, when people can attend an event free of charge, as applied to general admission areas on Thursday, 3 March, the whole value of the experience is consumer surplus.

Estimating consumer surplus

To estimate consumer surpluses, ideally a demand curve (also known as a willingness to pay curve) would be estimated for each facility (grandstand position and general admission area) and for each day, based on some evidence from similar events or a consumer survey. This is not possible here.

The most comparable case of which we are aware is contained in the evaluation of the V8 car races in Canberra[22]. In this case, the ACT Auditor-General was able to draw on a consumer survey of the price responsiveness of demand by the Centre for Tourism Research[23] to estimate a linear demand curve and a consumer surplus measure. The research for the 2000 V8 event indicated that the surplus was equal to 10.8 per cent of ticket revenues ($227 000 compared with ticket revenue of $2.1 million). This was about $9 per head. This estimated surplus reflected relatively high prices for the event[24].

In the case of the Australian Formula 1 Grand Prix, the AGPC policy is to maximise revenue by setting high market prices and by using strong price discrimination techniques. Four-day grandstand tickets vary with position from around $430 to $600. General admission tickets vary from around $20 to $100 with different prices for adults, children and seniors, and families.

[22] ACT Auditor-General's Office, 2002, op. cit.

[23] Centre for Tourism Research, *Price Sensitivity of Potential Patrons for the 2002 GMC 400,* prepared for Canberra Tourism and Events Corporation, University of Canberra, Canberra, 2001.

[24] ACT Auditor-General's Office, op. cit.

Consistent with the evidence for the ACT event, we consider that an assumed consumer surplus of 10.8 per cent of grand prix ticket revenue from sales to Victorians is reasonable in the absence of other data and the similarity of pricing strategies. Any consumer surplus of non-Victorians is not relevant.

As Figure A16 showed, an estimated 67 per cent of spectators are Victorian residents. It follows that the consumer surplus of Victorian residents was approximately $3 million ($41.5 million $\times$ 0.67 $\times$ 0.108).

To check for reasonableness, we note that of the approximate total of 341 500 paying attendances over the 4 days, 67 per cent were by Victorians amounting to 228 805 attendances. Our estimate of total consumer surplus ($3 million) implies that the average consumer surplus was $13.11 per Victorian attending the grand prix.

This appears to be a plausible average dollar figure compared with the $9 per head estimated for the V8 car races in Canberra in the ACT Auditor-General's report.

In addition, an estimated 28 100 Victorians attended free on Thursday, 3 March. Allowing a willingness-to-pay value of $13.11 per head, the consumer surplus for this day for those attending free was $368 391.

On these assumptions, total consumer surplus for Victorians was $3.4 million.

A4.4 Other benefits to Victorians

Indirect consumer benefits for Victorians

Victorians, principally residents of Melbourne, also gain consumer surpluses from attending grand prix-related events such as the F1 parade in the CBD which was organised for the 10th anniversary of the event and parties in Federation Square. In each case, they prefer to do this, rather than to do something else.

It was estimated that approximately 190 000 are involved in street parade and Federation Square activities. These are assumed to be local residents. For the sake of completeness, we assume an average consumer surplus of $10 from this.

There has been argument put that the consumer surplus for attendees at grand prix-related events such as the street parade should be the same as for attendance at the event itself. In other words, there should be an average consumer surplus of $13.11 per Victorian set across the board.

Activities such as the street parade and Federation Square were free of charge. If there was an average charge set at $13.11 to attend these activities, it would be reasonable to assume there would be some drop in attendance. It is therefore prudent to assume a lower consumer surplus than for attendance at the actual event itself.

On this basis, the indirect benefits would have a value of $1.9 million.

Civic pride and other non-use values

Households may be willing to contribute to a public project even when they do not consume its services. In principle, these non-use values are part of the social valuation of an event and part of a cost-benefit calculus.

However, by their nature, non-use values are difficult to observe and estimate. Careful surveys are needed to establish how much the community is willing to contribute to such things as culture, heritage and major sporting events that they do not actually attend. In responding to such surveys, households need to be fully aware of the opportunity cost of expenditure, since the contributions could also be spent on other economic or social services.

Also, as the ACT Auditor-General[25] pointed out, some members of the community may consider that major motor car races within cities detract from urban quality more than they contribute. This study is not able to reliably estimate any non-use values for the grand prix.

A4.5 Benefits to Victorian businesses and labour

While the assumption may be made that the grand prix will have the extra demand met by spare capacity and draw on unemployed labour and part-time workers who will work extra hours, finding values for these surpluses is difficult. The approach adopted for this study was to draw on the work of Dwyer et al[26]. In this, a variant of the Monash (CGE) model was used to estimate the impact on the New South Wales' economy of a 10 per cent increase in interstate and international tourism to New South Wales.

Unlike conventional CGE modelling, however, the Dwyer et al. study assumed that there were sufficient unemployed or part-time workers available to meet the extra demand, and that there was spare capacity in capital and land in businesses in New South Wales to also meet the demand without requiring additional capital and land.

In the Dwyer et al. analysis, a 10 per cent increase in tourism expenditure by international and interstate tourists in New South Wales would have the following effects:

[25] Ibid.

[26] L Dwyer, P Forsyth, R Spurr and T Ho, op. cit.

Figure A18
Business surplus resulting from an increase in tourism in New South Wales

	International tourism increase of 10 per cent		Interstate tourism increase of 10 per cent	
	($m)	% of gross exp.	($m)	% of gross exp.
Gross expenditure	636	..	540	..
Labour cost	268	42.1	221	40.9
Business surplus	96	15.1	101	18.7
Total increase in GSP	**364**	**57.3**	**322**	**59.6**

Source: L Dwyer, P Forsyth, R Spurr and T Ho, *The Economic Impacts and Benefits of Tourism in Australian, A General Equilibrium Approach*, Technical Report, CRC for Sustainable Tourism, 2005, p. 29.

In this example, the increase in the GSP resulting from the increase in tourist expenditure is taken to be the sum of the payments to labour and businesses in New South Wales. Because it was assumed that all of the output reflected in the value of GSP is produced by the application of unemployed or part-time labour to the spare capacity available in capital and land, all of the difference between labour cost and GSP is a surplus that accrues to existing capital and land. This is because no additional capital and land were required to meet the extra demand. The business surplus accruing to the state amounts to 15.1 per cent of gross international tourist expenditure, and 18.7 per cent of interstate tourist expenditure.

A simple weighted average would suggest that 16.9 per cent of additional tourist expenditure accrues as a surplus to business in New South Wales. This estimate is, of course, based on the special assumption about the extra demand being met from spare capacity in capital and land. The application of this result to the grand prix is set out below in the section headed “Business surplus”.

Similarly, because labour is available from the unemployed and part-time workers, there may be some element of surplus in the labour costs. A simple weighted average of labour cost as a percentage of the expenditure by international and interstate tourists would be 41.5 per cent. The development of some measure of surplus for the grand prix in Victoria is set out below in the section headed “Labour surplus”.

Expenditures by international and interstate visitors during the Grand Prix period

Figure A19 shows estimated expenditures per trip and per night by visitors to Victoria, excluding air fares and expenditures on grand prix tickets. Air fares are excluded because very little profit from air fares accrues to Victorian households. First, profits are low. Second, Qantas is based in Sydney and almost half foreign-owned. Virgin is based in Brisbane. Third, many overseas visitors use foreign airlines. Expenditure on grand prix tickets is excluded because this accrues to the AGPC and is counted separately. However, the numbers include expenditure on goods sold at the grand prix.

Figure A19
Estimated expenditures ($) by interstate and international visitors

	Extra visitors		Stay-extenders		Other visitors	
	Per trip	Per night	Per trip	Per night	Per trip	Per night
Interstate	1 248	275	1 490	277	1 340	201
Overseas	1 564	196	2 175	193	2 301	132

Note: Expenditure by interstate and international visitors excludes airfares and expenditure on grand prix tickets.

Source: National Institute of Economics and Industry Research, Economic impact evaluation of the 2005 Foster's Australian Grand Prix, August 2005

Figure A20 shows the additional gross expenditures in Victoria. The figures for the basic visitor groups are based on the numbers shown in Figures A16 and A19. The figures for media and grand prix team expenditure are taken from the NIEIR report[27]. The amounts total $60 million. This is lower than the NIEIR estimate of $73.9 million, which included expenditures on grand prix tickets and parts of air fares. Note also that the $60 million includes GST and excise tax payments to the Commonwealth Government.

[27] National Institute for Economic and Industry Research (NIEIR), op. cit., p. 23.

Figure A20
Additional expenditure in Victoria

Visitor group	Numbers	$/trip *(a)*	$ million
Interstate: extra trips	19 502	1 248	24.3
International: extra trips	8 262	1 564	12.9
Interstate: extended stay	1 149	1 490	1.7
International: extended stay	1 309	2 175	2.8
Sub-total			**41.7**
Media	*(b)* 668	*(c)* 3 593	2.4
Grand prix teams	*(b)* 2 000	*(c)* 7 950	15.9
Total			**60.0**

(a) Excludes purchase of grand prix tickets.

(b) Assumed break-up of 2 668 media and grand prix team visitors.

(c) NIEIR total figures divided by estimated numbers.

Source: National Institute of Economics and Industry Research, Economic impact evaluation of the 2005 Foster's Australian Grand Prix, August 2005

Business surpluses

Equation (1) shows how business surpluses after tax (π) may be estimated.

$$\pi = [\Delta E \times (1\text{-}IT] \times (1 - CI) \times (1 - DT) \qquad (1)$$

where ΔE is the increase in expenditure from international and interstate tourists, *IT* is indirect (GST and excise) taxes as a percentage of turnover, *CI* is the cost of inputs as a function of revenue less indirect tax, and *DT* is direct company income tax rate.

Plausibly, if IT=0.10, CI=0.8, and DT=0.3, so that the surplus after Commonwealth taxes would be 13 per cent of the change in gross pre-tax expenditure.

To gain insight into possible business surpluses, we held discussions with Tourism Victoria, the Victorian Employers Chamber of Commerce, and Restaurant and Catering Victoria. However, none of these organisations could provide an estimate of the business surplus per marginal dollar of tourism expenditure.

Drawing on Dwyer et al.[28] (Figure A18) as well as on Equation (1) and the related qualitative arguments above, for the central assessment in this report we allow that there is a marginal operating surplus after tax of 16.9 per cent of generated international and interstate visitor expenditures. However, assuming that 20 per cent of this surplus accrues to non-Victorian interests, the return accruing to Victorians after tax would be reduced to 13.5 per cent of this revenue, a figure comparable to that estimated above from plausible values. Allowing for $55 million in additional local expenditure (after deducting Commonwealth indirect taxes from the $60 million shown in Figure A20), the operating surplus for Victorian firms would be $7.4 million[29].

Given that the estimate of the business surplus of $7.4 million is based on the strong assumption from the Dwyer et al. analysis that all of the extra demand from interstate and international visitors is met completely from spare capacity in capital and land, and that there is therefore no crowding out, the $7.4 estimate should be seen as an upper bound.

Given that conventional CBA would allocate a zero value to the surplus on the basis of assuming full employment of labour, capital and land, and that all factors were priced at their opportunity cost (i.e. no surplus), it would be prudent to take an average position between these 2 perspectives and allocate half of the $7.4 million ($3.7 million) as the central value. A zero value would not capture the potential for the demand created during the limited duration of the grand prix to be met from spare capacity in the hotel, catering and restaurant industries.

Similar considerations will be applied below in the determination of labour surpluses arising from the grand prix.

Labour surpluses

To estimate labour surpluses, the following formula may be used

$$LS = E \times A \times B \times C$$

Where LS = labour surpluses
E = additional international and interstate tourist expenditure in Victoria
A = proportion of expenditure spent on labour
B = percentage of A that is done by extra local labour employment
C = percentage of wage that represents a surplus to the additional labour employed

E has been estimated at $55 million. Based on the numbers from Dwyer et al. above, the simple average value for A is 41.5 per cent.

[28] Dwyer, L., Forsyth, P., Spurr, R. and T. Ho, *The Economic Impacts and Benefits of Tourism in Australia, A General Equilibrium Approach*, Technical Report, CRC for Sustainable Tourism, 2005.

[29] No allowance is made for the possibility that a small part of the Commonwealth's indirect tax revenue may be returned to Victoria.

B represents the proportion of the labour employed to meet the extra demand flowing from the grand prix that is not diverted from other employment in the Victorian economy. While diverted labour may enjoy some labour surplus, this is likely to be low and ignored here. Relevant to estimating B is that part-time workers constitute about one-third of the whole employed work force in Australia and presumably a higher proportion in the tourism sector. It would be reasonable to take B = 0.5. This means that half of the additional labour comes without reducing output elsewhere in the Victorian economy.

C is likely to be a positive number. If a worker is indifferent between working for $20 an hour and leisure, then some amount over $20 (say $25) needs to be offered to induce more hours of work. It is true that with perfect information on labour wage requirements and no search and transaction costs, an employer may find the workers who are willing to work for the least surplus, say $20.50 per hour. But that is not reality. Accordingly, C is assumed at about 0.15. Thus, on these estimates

$$LS = E \times 0.415 \times 0.5 \times 0.15 = 0.03E$$

With E = $55 million, LS would = $1.7 million. Once again this is an average figure. If the assumption of no crowding out was adopted, the figure would be $3.4 million, that is if the additional workers were not diverted from other employment. On the other hand, if all the additional workers were diverted from other employment in the Victorian economy the figure would be zero.

A5. Overall cost-benefit result for 2005

A5.1 Cost-benefit outcome for Victoria

Figure A21 summarises the cost-benefit outcome of holding the 2005 grand prix.

Figure A21
Costs and benefits for Victoria of holding the 2005 grand prix

Costs	$m	Data source
Costs with a high degree of reliability -		
GP construction and operation costs	68.1	From AGPC accounts.
Total of costs with a high degree of reliability	**68.1**	
Costs based on best estimates -		
Other GP-related government costs	0.5	Information from other agencies.
Loss of park uses and amenity	0.4	Research by Lansdell and Gangadharan (2003) on the informal recreational value of Albert Park using the travel cost method.
Transport congestion	0.5	VicRoads and Austroads (2005) for estimates of travel time costs.
Noise costs	0.2	Port Phillip Council, Doctors Working Group (1994), and estimates of impact of noise on property values in Boardman et al. (2006).
Total of costs based on best estimates	**1.7**	(Actual dollar totals in Figures A10 and A11 result in a rounding up to $1.7 million).
Total costs based on the most reliable data and best estimates	**69.8**	

Figure A21
Costs and benefits for Victoria of holding the 2005 grand prix - *continued*

Benefits	$m	Sources
Benefits with a high degree of reliability -		
Visitor payments to AGPC	41.5	From AGPC accounts.
Sponsor payments to AGPC	10.9	From AGPC accounts.
Total of benefits with a high degree of reliability	**52.4**	
Benefits based on best estimates -		
Consumer surpluses accruing to Victorian visitors	3.4	Assumed central case that consumer surplus was 10.8 per cent of ticket sales to Victorians. Impact of sensitivity analysis for higher and lower values is set out in Figure A22 below.
Other consumer benefits of Victorians	1.9	Assumes $10 consumer surplus for 190 000 residents of Victoria who participate in off-track events. (This mainly related to a one off event to celebrate the 10th anniversary of the GP)
Business surplus accruing to Victorian businesses during GP	3.7	Assumed a business surplus of 13.5 per cent of international and interstate expenditure other than GP tickets based on Dwyer et al. (2005) and adjusted for crowding out.
Labour surplus	1.7	Assumed that 3 per cent of international and interstate expenditure other than GP tickets is a surplus based on Dwyer et al. (2005) and adjusted for crowding out.
Total benefits based on best estimates	**10.7**	
Total benefits based on most reliable data and best estimates (52.4+10.7)	**63.1**	
Net benefits (benefits-costs) based on the most reliable data for benefits and costs (52.4–68.1)	**-15.7**	
Net benefits based on best estimates for additional benefits and costs (10.7-1.7)	**9.0**	
Overall net benefit using the most reliable data and best estimates for benefits and costs (63.1–69.8)	**-6.7**	

Source: Commissioned study.

Total costs are estimated at $69.8 million.

The costs of producing the event amounted to $68.1 million. These costs, therefore, accounted for 98 per cent of all costs.

Grand prix related government costs amounted to approximately $500 000. This related to costs incurred but not recovered from the AGPC.

The community costs – loss of park uses and amenity, traffic diversion and congestion, and noise – accounted for a further $1.2 million. This is a significant local cost, but only 2 per cent of total estimated cost.

The estimated benefits total $63.1 million. Payments to the AGPC represent approximately 83 per cent of the total. Accordingly the estimated net social benefit is $-6.7 million and the benefit-cost ratio is 0.9.

These results appear robust. Expenses incurred by the AGPC account for 98 per cent of the costs to Victoria. Although the estimated community costs of $1.2 million in total (loss of park uses and amenity, traffic diversion and congestion, and noise) are order-of-magnitude estimates, varying these costs up or down by 50 per cent makes very little difference to the total cost.

Turning to the benefits, payments to the AGPC make up approximately 83 per cent of the estimated benefits and are again a known figure. Also, in the judgment of the audit's technical advisory group, the estimates of consumer, business and labour surpluses are plausible.

A5.2 Sensitivity analysis

Given the role of these best estimates of benefits in offsetting the negative net benefit amount derived from more reliable data, we applied a sensitivity analysis to the estimates of Victorian consumer surplus and Victorian business and labour surpluses to assess whether arguable ranges of the estimates for these items would make a significant difference to the overall net benefit. Figures A22, A23 and A24 show the results in terms of the change to the net benefit when each is considered in isolation.

Figure A22 shows the sensitivity of the overall net benefit derived in Figure A21 to variations in the estimate of consumer surplus as a percentage of ticket revenues. If the percentage was increased by 2 percentage points (effectively increasing consumer surplus received by Victorian visitors to the grand prix), the net benefit moves to $-6.2 million. Decreasing it by 2 percentage points moves the net benefit to $-7.3 million.

Figure A22
Sensitivity analysis of
consumer surplus estimates on overall net benefit

Consumer surplus as a per cent of ticket revenues		Total consumer surplus	Overall net benefit
(%)		($m)	($m)
12.8		3.9	-6.2
10.8	(best estimate)	3.4	-6.7
8.8		2.8	-7.3
6.8		2.3	-7.8

Source: Commissioned study.

If we were to reduce it to 6.8 per cent of ticket revenues as the measure of consumer surplus, in the belief that the organisers of the grand prix were able to inject considerable price discrimination into ticket pricing, the estimate of overall net benefit would fall to $-7.8 million.

Figure A23 shows the sensitivity of the overall net benefit derived in Figure A21 to variations in the estimate of business surplus as a percent of international and interstate tourist expenditure other than on grand prix tickets. The upper level of $7.4 million in business surplus gives rise to an overall net benefit of $-3 million. This would apply if all of the extra output induced by interstate and international tourist expenditure other than on Tickets for the grand prix was produced using spare capacity in the Victorian economy, so that crowding out did not apply.

Figure A23
Sensitivity analysis of business surplus estimates
on overall net benefit

Business surplus as a percentage of international and interstate tourist expenditure other than GP tickets.		Total business surplus	Overall net benefit	Crowding out assumption
(%)		($m)	($m)	
13.5		7.4	-3.0	No crowding out
6.75	(best estimate)	3.7	-6.7	50 per cent crowding out
0		0.0	-10.4	Complete crowding out

Source: Commissioned study.

If it was assumed that complete crowding out did occur, and that the extra output would require additional capital and labour with their associated costs, then the overall net benefit falls to $-10.4 million.

Figure A24 shows the sensitivity of the overall net benefit derived in Figure A21 to variations in the estimate of labour surplus as a percentage of international and interstate tourist expenditure other than on grand prix tickets. The best estimate for labour surplus is derived from Dwyer[30] combined with the assumption of 50 per cent crowding out, so that half the extra labour required to meet the extra demand from international and interstate tourists is diverted from other uses in the Victorian economy. If it was assumed that there was no crowding out the overall net benefit would rise to $-5 million, while with complete crowding out it falls to $-8.4 million.

Figure A24
Sensitivity analysis of labour surplus estimate on overall net benefit

Labour surplus as percentage of gross international and interstate expenditure	Labour surplus	Overall net benefit	Crowding out assumption
(%)	($m)	($m)	
6	3.4	-5.0	No crowding out
3 (best estimate)	1.7	-6.7	50 per cent crowding out
0	0.0	-8.4	Complete crowding out

Source: Commissioned study.

The results of these sensitivity tests demonstrate that the size of the best estimate of the overall net benefit to Victoria from the Grand Prix ($-6.7 million) does not change significantly in the face of plausible variations in the estimate for consumer surplus, business surplus and labour surplus, and that none of the variations alone has the capability of turning the negative net benefit into a positive net benefit.

Similarly when the most optimistic and the most pessimistic of the sensitivity outcomes for consumer surplus, business surplus and labour surplus are combined in Figure A25, the optimistic outcome is $-0.8 million and the pessimistic outcome is $-13.2 million.

[30] Dwyer, L., Forsyth, P., Spurr, R. and T. Ho, *The Economic Impacts and Benefits of Tourism in Australia, A General Equilibrium Approach,* Technical Report, CRC for Sustainable Tourism, 2005

Figure A25
Range of outcomes for the overall net benefit when the sensitivity tests are combined

Outcome	Assumptions	Overall benefit	Net benefit (overall benefit less $69.8 million)
		($m)	($m)
Most optimistic	Consumer surplus 12.8 per cent, business and labour surpluses with no crowding out	69.0	-0.8
Central estimate	Consumer surplus 10.8 per cent, business and labour surpluses with 50 per cent crowding out	63.1	-6.7
Most pessimistic	Consumer surplus 6.8 per cent, business and labour surpluses with 100 per cent crowding out	56.6	-13.2

Source: Commissioned study.

A5.3 Distributional analysis

The major distributional effects are shown in Figure A26.

Figure A26 shows costs are borne by the government (Victorian households as taxpayers) and by local households around Albert Park.

Figure A26
Main distributional effects using most reliable data and best estimates

Victorian agency-party	$m
Government	-16.2
Local (Albert Park) households	-1.1
Victorian businesses	3.7
Victorian labour	1.7
Victorian consumers	5.3
Total	**-6.6**

Note: "Government" relates to Australian Grand Prix Corporation expenses less receipts plus the net expenses of other government agencies.
Source: Commissioned study.

However, as NIEIR has shown, the impact on business interests in Melbourne is variable. NIEIR[31] reported that, for the week of the grand prix, 40 per cent of respondents indicated that business was down, 32 per cent stated that it was increased, and 28 per cent stated that it was the same.

[31] National Institute for Economic and Industry Research (NIEIR), op. cit., p. 39.

A6. Concluding observations

A6.1 Cost-benefit analysis of the grand prix in the long run

This study is a cost-benefit analysis of holding the 2005 grand prix. As such, it is an analysis of a one-off event.

A cost-benefit study of the initial decision to start holding the grand prix in Melbourne in 1996 or to continue to hold the event from 2011 would differ in various ways. For example, a long-run study would include or consider:

- *Capital expenditures on behalf of the grand prix*

  This study did not include relevant capital expenditures. Nor did it include depreciation expenditures.
- *Options to restore or upgrade Albert Park*

  This would include the expense of the upgrade but it could also include higher opportunity costs of using the park for a grand prix race track.
- *Ongoing tourism generation effect*

  In this study the effect of one grand prix on the numbers of future tourists was assumed to be negligible. However, to assess whether there was a long-run tourism effect, the outcomes of the grand prix as a marketing instrument would need to be evaluated.

A6.2 Cost-benefit and gross state product analyses

In the short run, the change in GSP is a function of changes in expenditure in the state, less imports. Assuming Victorian Government and household expenditures are unchanged, the change in GSP depends on additional international and interstate expenditure, less imports. In these calculations, the expenditure increase is $55 million.

The extent to which this extra expenditure on goods and services in Victoria results in extra GSP in the short run depends on:

- how much is met by additional local production (because there is spare capacity or by employing extra labour)
- how much is met by imports of goods and services.

In relation to this CBA, increased output is not itself a welfare benefit. It is a benefit only in so far as it produces surpluses to capital, land, or labour. These estimated benefits are included in the CBA. Gross output is not included in the CBA.

On the other hand, a CBA includes consumer surpluses that are not included in GSP.

A6.3 Cost-benefit analysis for Australia

The CBA of the grand prix for Victoria differs in 3 main ways from a CBA for Australia.

First, any surpluses that do accrue to Victorian businesses and labour arise because interstate visitors spend less in other parts of Australia. Some of these business and labour surpluses represent a possible reduction in income from other parts of Australia. These would need to be accounted for in an Australian cost-benefit study.

Second, Commonwealth tax revenues are Australian benefits.

Third, the consumer surpluses of interstate visitors would be included in an Australian study.

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B Commissioned study: Computable general equilibrium analysis

B1. Executive summary

B1.1 Introduction

Allen Consulting Group was commissioned by the Victorian Auditor-General's Office to conduct a computable general equilibrium (CGE) analysis to determine the economic effects of 2005 Formula 1 Australian Grand Prix, especially the effects on the Victorian economy. VAGO, as part of its oversight of this study, was advised by Dr Frank Harman and a technical advisory committee consisting of Professor Harry Clarke (Head of Department of Economics and Finance, Latrobe University) and Professor Leo Jago (Deputy CEO and Director of Research, Sustainable Tourism CRC, Victoria University).

The National Institute of Economic and Industry Research (NIEIR) was commissioned by the Australian Grand Prix Corporation (AGPC) to conduct an economic evaluation of the 2005 F1 grand prix using its IMP economic model of the Australian and Victorian economies. This model has an input-output structure linked to a model that estimates Gross Domestic Product (GDP) and Gross State Product (GSP).

For procedural fairness purposes, the study undertaken by the Allen Consulting Group was provided to NIEIR for comment. Its response is outlined in full in Attachment B2.

The results from these 2 studies are included in Figure B1 below. Scenario 2 represents the best estimate of the level of economic value derived from the 2005 Formula 1 Grand Prix as it is based on more persuasive assumptions and a more robust and transparent modelling approach.

Figure B1
Economic effects of the 2005 grand prix to Victoria

	Scenario 1 MMRF	Scenario 2 MMRF	NIEIR's IMP model
Gross State Product (GSP) ($m)	101.8	62.4	165.7
GSP plus induced tourism ($m)	110.9	62.4	174.8
Private investment ($m)	24.1	12.7	54.0
Private consumption ($m)	56.8	16.1	78.6
Public consumption ($m)	12.6	3.6	-
State tax receipts ($m)	11.9	3.5	15.2
Full time employment positions (no.)	600	400	3 650

Source: MMRF modelling and National Institute of Economic and Industry Research economic impact evaluation of 2005 grand prix

B1.2 Types of economic modelling

In estimating the effects of an event such as the grand prix, both input-output and CGE models use direct spending (e.g. spending on accommodation by interstate and overseas grand prix patrons) as inputs, with the models determining the overall economic effects, as enhanced economic activity in one part of the economy (e.g. the hotel industry) affects other parts of the economy.

For direct spending impacts of a given size, the differences in estimated overall economic effects between the models reflect differences in the models' structures. Unlike input-output models, CGE models place supply constraints on the economy, and households and producers in the model respond to any price changes that are determined within the model. Consequently, the macroeconomic effects of an event such as the grand prix estimated by a basic input-output model will be nearly always larger than that estimated by a CGE model.

The computable general equilibrium model used in this report is the MONASH Multi-regional Forecasting (MMRF) model that is maintained by the Centre of Policy Studies at Monash University. The MMRF model has had a long history of use by various state and Australian government agencies and is being maintained with up-to-date values of relationships between economic variables. The workings of the MMRF model have been documented and subjected to peer review. Despite the robustness and transparency of the MMRF model, it should be borne in mind that modelling can only provide an estimate of economic effects and therefore the results of the CGE modelling should be considered in this context.

B1.3 Modelling approach

Two input scenarios for MMRF modelling purposes were considered. Scenario 1 models the effect of the grand prix using the actual or the equivalent of the direct impacts estimated by NIEIR. Total direct impacts of the grand prix were estimated by NIEIR at $107.6 million. That figure, however, includes the induced tourism impact, which was not included as an input to NIEIR's IMP model but was included as an add-on to the modelling results because of the uncertainty over the value that should be given to it.

When this impact, as well as NIEIR's estimate of imports foregone as a result of spending on the grand prix instead of imports, are excluded as inputs into the modelling, this results in estimated direct impacts to Victoria, equivalent to NIEIR's, of $87.7 million as input to the MMRF model. Imports foregone nevertheless will be determined within the model and their explicit inclusion would thus be double-counting.

Under Scenario 1, because the same impacts and their values as estimated by NIEIR are included in the modelling using the MMRF model, any differences in estimated economic effects of the grand prix from those estimated by the NIEIR model are thus due solely to differences in the structures of the 2 models.

Scenario 2 is based on more persuasive assumptions about direct impacts (also refer to Part 6 of this report), particularly in relation to the question of whether some part of the spending on the grand prix by Victorian visitors to the grand prix is truly incremental, or simply a substitute for other spending that would have taken place in the absence of the grand prix. Induced tourism was excluded as an assumption in the modelling due to concerns with the quality of data however, if empirical research had been conducted, the outcomes from such a study could have altered the modelling results. Under Scenario 2, the direct impacts to Victoria are $58.4 million.

Under Scenario 2, any differences in estimated economic effects of the grand prix that are estimated by the NIEIR and MMRF models are due to both differences in the structures of models and differences in inputs to the models.

The economic effects of the F1 grand prix, as modelled using the MMRF model, were found to be substantially lower than those estimated by NIEIR.

In Scenario 1, the increase to Victorian GSP is estimated to be $101.8 million, which is 38.6 per cent lower than NIEIR's estimate. The employment effects to Victoria were also found to be substantially lower (600 positions compared with NIEIR's 3 650 positions). As discussed above, the different estimates can be explained by the structural differences of the 2 models. The MMRF model produces more conservative results as it takes into account capacity constraints and the impact of price changes (such as wages, rates of return on investment and the exchange rate).

In Scenario 2, the increase to Victorian GSP due to the grand prix was estimated to be $62.4 million, which is 62.3 per cent lower than NIEIR's estimate. The MMRF modelling results for private investment, private consumption and state taxation were again smaller - between 76 and 79 per cent lower than NIEIR's estimate. This outcome is explained by the different input assumptions used as well as the differences between the structures of the 2 models.

In summary, the likely economic effects of the 2005 grand prix would more closely reflect the results obtained in Scenario 2 as they are based on more persuasive assumptions about the nature and size of the direct impacts of the grand prix on the Victorian economy, and they are obtained through a more sophisticated and transparent model of the Victorian economy.

B2. Introduction

B2.1 Background

Formula One (F1) racing is generally recognised as the pinnacle of motor racing. It attracts large audiences at the tracks where the races take place, worldwide television audiences, media attention, and a large amount of corporate and government sponsorship.

The F1 season is conducted each year throughout major cities around the world. The Australian leg of the F1 season (the Australian F1 grand prix) has been held in Melbourne since 1996. The Victorian Government provides significant funding for this event - for the 2005 event, government contributions amounted to approximately $16 million[1].

One rationale for government support of major events like the grand prix is that they generate substantial economic benefits, for instance, spending by people on hotels and entertainment who attend the event. In 2005, there were 32 898 interstate and overseas visitors to Victoria who made a special trip or extended their stay to attend the grand prix.

A report by NIEIR for the AGPC estimates an economic effect (the increase in Victorian GSP) of approximately $175 million to Victoria as a result of conducting the 2005 Australian F1 Grand Prix[2].

[1] Australian Grand Prix Corporation 2005, *Annual Report 2005,* p. 27.

[2] National Institute of Economic and Industry Research, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*. A report for the Australian Grand Prix Corporation, Melbourne, 2005, p. 33.

B2.2 Objectives of the study

In line with our overall audit objectives, we wished to determine the economic effects derived by Victoria from the 2005 Australian F1 Grand Prix and used CGE modelling.

The remainder of this study is set out as follows:

- Section 2 presents an overview of CGE analysis and its advantages. An overview of MONASH MMRF, the CGE model used in this study, is also presented.
- Section 3 discusses and describes the input assumptions that were applied to the MMRF model to estimate the wider economic effects to Victoria arising from the grand prix. Two scenarios are presented.
- Section 4 concludes with the reporting of the MMRF modelling outputs for the 2 modelling scenarios. These results are compared against those reported by NIEIR.

B3. Overview of CGE analysis

B3.1 Why use CGE analysis?

Studies to date of the economic effects of the Australian F1 Grand Prix have been performed using NIEIR's IMP model. Although there are few published details relating to this model's structure, we understand that IMP is a macroeconomic model based on IO foundations[3].

IO analysis typically involves:

- developing a model of the economy that quantifies relationships between sectors in terms of the effects that an increase in value of output in one sector will have on the value of output in other sectors
- entering into the model an exogenous increase (or external "shock") in the value of output in one or more sectors[4], and "solving" the model to calculate the resultant increases in output from these and all other sectors of the economy in successive rounds of expenditure as other sectors increase output to provide inputs to meet the new demand for goods and services, and then to meet the additional demand for inputs, and so on.

[3] For instance, see the New South Wales Office of Financial Management's review of the IMP model in Appendix A.2., in Office of Financial Management 1997, *The Economic Impact of the Sydney Olympic Games*, Research and Information Paper TPR 97-10, available at: <http://www.treasury.nsw.gov.au/pubs/trp97_10/>. Moreover, NIEIR (2005, p.4) in its assessment of the 2005 grand prix describes it model as "an industry activity model with an IO structure linked to an income formation model".

[4] Exogenous means the value is determined outside the model.

The solution to an IO model can be expressed as a set of multipliers that indicate the increase in the value of outputs in each sector of the economy arising from a one dollar increase in value of output in one particular sector. A practical way of performing input-output analysis in policy analysis (that is, without needing to build a separate model) is to apply the multipliers derived from other IO models on to assumptions about the size of exogenous shocks. Wider economic effects such as GSP, employment, consumption and investment can then be measured[5].

The key limitation of IO models, and indeed multipliers, is that they are demand oriented and do not consider supply-side constraints on labour, capital or land. In particular, IO models generally assume that unlimited, unemployed labour and capital are freely available at a fixed price. There is no trade-balance constraint, nor is any constraint on the government's borrowing position assumed.

Moreover, IO models assume that, for each industry, fixed amounts of all intermediate and primary factor inputs are required to produce a unit of output. This eliminates all possibilities for industries responding to changes in relative prices and adjusting their input structures accordingly.

As a consequence, the additional demand for domestic commodities generated directly and indirectly by an exogenous event is always accommodated in IO models by increased domestic output, without any crowding out of other elements of domestic demand.

By effectively not accounting for crowding out effects and price changes, IO analysis can exaggerate the benefits of projects to an economy. Concerns about the use of IO multipliers have been raised by the Western Australian Department of Treasury and Finance[6]:

> "While multipliers can be a useful way of summarising and quantifying interlinkages within the economy, they are more often abused than used correctly.
>
> "Multipliers are used to suggest that an industry is more valuable to Western Australia than its current size would suggest. They are used to show substantial flow-on benefits to the broader economy and to justify claims for government support for that activity.
>
> "However, multipliers do not provide a measure of net economic benefit of expanding activity in a particular area. They are based on limiting assumptions and dated information."

[5] The most comprehensive IO table is the national IO table maintained by the Australian Bureau of Statistics (ABS). The latest ABS IO table is based on 2001-02 data. It is, however, inappropriate to apply national multipliers to estimate state effects due to differences in economic structures. Although the ABS does not produce stand-alone IO tables for state economies such as Victoria, a Victorian IO table can be derived from the MONASH regional database. This database is currently used to support the MMRF model. See Paul Gretton 2005, "Australian Input Output Tables", *Australian Economic Review*, Vol. 38, pp. 319-32.

[6] Western Australian Department of Treasury and Finance 2002, "The Use and Abuse of Input-Output Multipliers" in Economic Research Articles, Economic Research Paper March 2002.

A more defensible approach to estimating the economic effect of a major tourism event like the grand prix is to use a CGE model. Inherent in CGE models is the assumption of optimising behaviour by households and producers in the context of the capacity constraints in the economy. Generally, CGE models of economies are characterised by[7]:

- prices and quantities that are determined within the model (endogenous determination)
- the equilibrium allocation of economic factors (land, labour and capital) between alternative uses such that no economic factors are in involuntary unemployment
- competitive product (goods and services) and factor (land labour and capital) markets
- supply and demand being equalised at the equilibrium prices
- household decisions over the demand for products and the supply of factors being based on utility maximisation subject to price and income constraints (optimising behaviour)
- supply of products and demand for factors by producers being based on the objective of profit maximisation, subject to the constraints of technology.

B3.2 The MMRF model

The computable general equilibrium model used in this analysis is the MMRF model that is maintained by the Centre of Policy Studies at Monash University. MMRF generates outputs at the macroeconomic (state and national) level and also by region and industry.

The model is built from the “bottom up” and states are linked via interstate trade, interstate migration and capital movements. The MMRF model is comprised of 8 Australian regions (the 6 states and 2 territories) and 56 sub-state regions. At the state level, there is detailed modelling of the behaviour and interactions of 5 types of economic entities:

- *industries:* there are 49 industry sectors, including “Accommodation and restaurants”. Investment is allocated across industries to maximise rates of returns to investors
- *capital creators:* there are capital creators for each industry that produce units of industry-specific capital in a cost-minimising manner
- *households:* there is a single household in each state
- *governments:* there is a state government in each state and a Commonwealth Government
- *foreigners:* the behaviour of foreigners is summarised by export demand for the products of each state and by supply of international imports to each state.

[7] Jack Pezzey and Ross Lambie 2001, *CGE Models for Evaluation Domestic Greenhouse Polices in Australia: A Comparative Analysis*, Consultancy report prepared for the Productivity Commission.

As is standard in CGE models, MMRF determines the supply and demand for each regionally produced commodity as the outcome of producers and consumers who seek to obtain the optimal outcomes. Industries are assumed to choose labour, capital and land so as to maximise their profits while operating in a competitive market.

In each region, a representative household purchases a particular bundle of goods in accordance with the household's preferences, relative prices and disposable income. The specifications of supply and demand behaviour coordinated through market clearing assumptions comprise the general equilibrium core of the model.

MMRF also has dynamic features that enable forecasts about economic variables on a year-on-year basis, and the results for a particular year are used to update the database for the next year. For example, the model contains a series of equations that connect capital stocks to past-year capital stocks and net investment.

Similarly, debt is linked to past and present borrowing/saving, and regional population is related to natural growth and international and interstate migration. The model is populated using data from the MONASH regional database, which in turn is based on the Australian IO tables developed by the Australian Bureau of Statistics[8].

The MMRF model has had a long history of use by various state and Australian government agencies and is being maintained with up-to-date values of relationships between economic variables. The workings of the MMRF model have been documented[9], and subjected to peer review[10].

The mechanics of MMRF

In principle, increased demand for locally produced goods and services associated with a major tourism event such as the grand prix affects the Victorian economy in a variety of ways. First, there are the direct demand effects experienced by the producers of the final goods and services purchased by the additional spending. A good example is the restaurant industry in the context of the grand prix.

[8] Paul Gretton 2005, "Australian Input Output Tables", *Australian Economic Review*, Vol 38:319-32.

[9] Documentation of the assumptions underpinning the MMRF model, the basis of the MMRF-GREEN model, is available at the Centre of Policy Studies website. In particular, see M Peter., M Horridge, GA Meagher, F Naqvi and B Parmenter 1996, "The theoretical structure of the Monash-MRF" Centre of Policy Studies and the IMPACT Project Preliminary Working Paper OP-85 available at: <http://www.monash.edu.au/policy/ftp/workpapr/op-85.pdf>, PD Adams, MJ Horridge and G Wittwer 2003, "MMRF-GREEN: A Dynamic Multi-Regional Applied General Equilibrium Model of the Australian Economy, Based on the MMR and MONASH Models", CoPS Working Paper G-140, Centre of Policy Studies and Impact Project, Monash University, Melbourne, p. 70.

[10] Published works applying this model include P D Adams, MJ Horridge and BR Parmenter 2000, "Forecasting for Australian Regions Using the MMRF-GREEN Model", *Australasian Journal of Regional Studies*, vol. 6, no. 3, pp. 293–322.

These direct effects are followed by a succession of indirect demand effects. These are first felt when the producers of the additional goods purchased as part of the grand prix demand more intermediate inputs from other industries, and construct and install new plant and equipment. The initial indirect demand effects set in train further rounds of indirect effects as firms supplying the intermediate inputs and supplying the new investment spending raise their own production levels in order to meet the increased demand, and so on.

At each stage of the process, induced income effects may augment the direct and indirect demand effects. These induced income effects occur when the households supplying the additional labour, and the owners of the newly utilised fixed capital, spend their increased incomes on final goods and services. As before, this spending sets off further successive rounds of indirect demand effects, and consequently further induced income effects.

The sequence of demand effects described above arises from the linkages between industries in the chains of production and distribution of goods and services. An IO model is designed to capture these inter-industry linkages. The MMRF model, however, builds on the IO framework by allowing for the inclusion of the constraints absent from the IO calculations, including general specifications about the behaviour of agents (consumers, producers and investors).

Substitution possibilities are incorporated in the MMRF model so that the behaviour of agents in the model is sensitive to changes in relative prices as well as to quantity variables. For example, if prices in one state rise relative to the prices of goods produced in another state, then purchasers will substitute interstate goods for local goods. Similarly, if wages rise relative to the cost of employing capital, then capital-labour ratios tend to rise.

An implication of including the additional constraints together with an active price mechanism is that the expansion effects of increased spending in one area tends to be offset by crowding out of other elements of demand.

For example, suppose the economic activity associated with the grand prix pushes up the demand for skilled labour in Melbourne. In the presence of a constraint on labour supply of certain skills, this will bid up wage rates, increasing the production costs of all industries. Those industries facing international competition will be unable to pass on these cost increases and will be forced to cut back output and employment.

Another example is that spending at the grand prix by overseas visitors could put upward pressure on the real exchange rate. This encourages imports and forces domestic import-competing industries to cut back output and employment.

By contrast, IO models do not incorporate the possibility of crowding out and instead assume that the economic factors necessary to respond to any increased demand do not come from existing production uses.

It follows, therefore, that in a multi-sector CGE model like MMRF, which incorporates a set of economy-wide constraints, the macroeconomic effects of the grand prix will be nearly always smaller than that predicted using a basic IO model. For Victoria, they will be positive. However, at the national level it might be that the positive effects for Victoria are offset by contractions in output elsewhere.

Key MMRF modelling assumptions

The fundamental MMRF assumptions employed in the analysis of the grand prix are discussed below.

Labour markets

The MMRF model assumes that the grand prix has no effect on national employment, with the national real wage rate adjusting to ensure that national employment does not change. This is a standard long-run modelling assumption, based on the idea that in the long-run national employment is determined by demographic factors (birth rates, death rates etc.) which are unaffected by the grand prix.

It is appropriate to model the grand prix in this way because it is a recurring event, having taken place in Victoria since 1996, and in Adelaide over the previous decade. Thus in the simulation results, the national labour market effects of the event will be revealed as changes in the national real wage rate, rather than as changes in national employment.

At the state level, it is assumed that labour is mobile between state economies. As a consequence, a state that is favourably affected by the grand prix (that is, Victoria) will experience increased employment relative to states that are less favourably affected.

Public expenditure, tax rates and government budgets

Real public consumption expenditure is assumed to move with real private consumption expenditure in response to the activity associated with the grand prix. Government budget balances (Commonwealth and state) are held fixed in the model via endogenous changes in lump-sum payments to households. It follows, therefore, that any increase in taxation receipts arising from the grand prix will be immediately passed on to households.

Consumption

Real consumption is assumed to change in line with changes to real income available to residents. In calculating real income available for consumption, the MMRF model takes account of direct income from labour and capital (with an allowance for the net flow of foreign income), income from other sources such as government welfare payments, and income tax.

Rates of return on capital

In MMRF, rates of return on capital are defined as unit profit divided by the unit cost of investment. For the long-run results reported here, the rates of return are fixed in the model via endogenous capital adjustment. Thus industries that benefit from the grand prix (for example, the Victorian accommodation sector) will receive increased capital (at a fixed rate of return), compared with industries that do not benefit.

B3.3 Differences in modelling results

Conceptually, the way in which the MMRF model is used to measure the wider effects of a policy initiative is similar to the way used in an IO model. That is, direct impact assumptions (the exogenous shocks) are developed and entered into the model to derive an expansion of outputs and effects on GDP and employment.

The results of economic evaluations between a CGE analysis and an IO analysis can differ due to:

- *differences in model structures:* as discussed above, the structure of the MMRF model is different from NIEIR's IMP macroeconomic model. The MMRF model recognises that the resources in the economy (labour and capital) used to create goods and services are limited in supply, so that it is not possible to create more output simply by spending more money. In contrast, in the IMP model, there appear to be no resource constraints
- *differences in the direct impacts:* the direct impacts or exogenous shocks to the economy (such as the incremental tourist expenditure generated by the grand prix event) are the inputs to the modelling. Outcomes will, therefore, differ depending on the assumed impacts, and their values, that are inputs to the models.

This study estimates the economic effects of the grand prix in 2005. In order to compare the differences that are solely attributable to the differences in the model structures, we will apply NIEIR's direct impact assumptions to the MMRF model (Scenario 1).

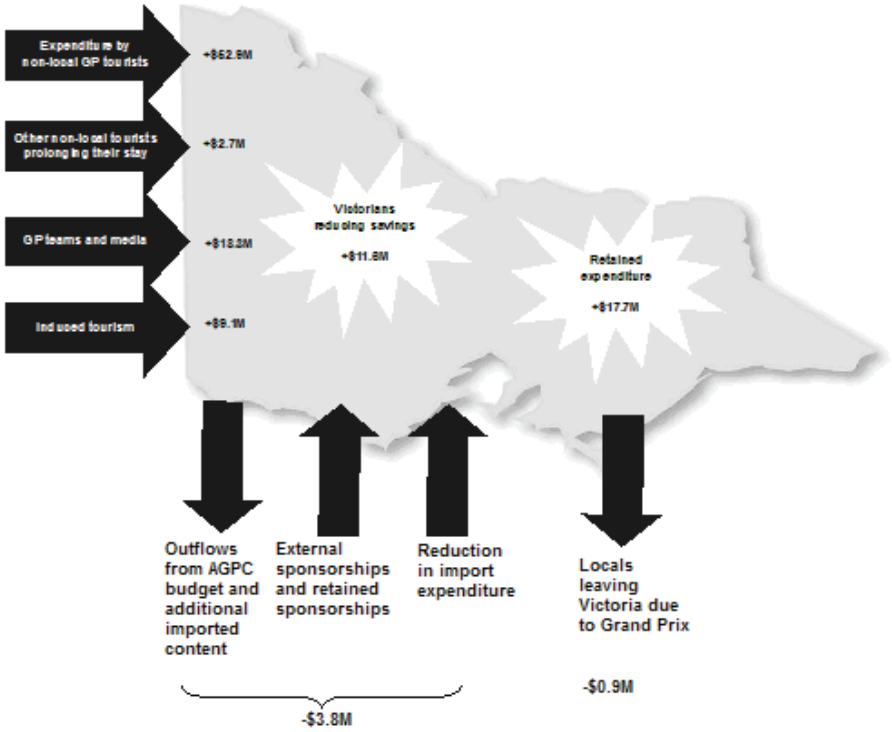
However, as explained in the following section, a number of direct impact assumptions adopted by NIEIR are contestable. In light of this, an alternative modelling scenario (Scenario 2) with a different set of direct impact assumptions was developed and applied to the MMRF model.

B4. The direct impacts of the grand prix to Victoria presented in the NIEIR report

B4.1 Introduction

This chapter discusses the direct impact assumptions used by NIEIR to estimate the wider economic effects of the 2005 Australian Formula 1 Grand Prix to Victoria. In total, NIEIR reports a direct economic impact of $107.6 million to Victoria. These are summarised in Figure B2.

Figure B2
NIEIR's direct impacts of the 2005 grand prix to Victoria



Source: National Institute of Economic and Industry Research 2005, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*. A report for the Australian grand prix Corporation.

B4.2 Expenditure by visitors

The grand prix generates exports from Victoria by attracting new visitors to the state. These include:

- interstate and overseas tourists
- interstate and overseas media representatives
- interstate and overseas drivers, team members and officials.

Some of these visitors would not have otherwise visited the state, and therefore, the spending by these visitors is incremental to Victoria in that it would not have occurred without the grand prix. Incremental expenditure also includes the additional spending by visitors who prolonged their stay in Victoria as a result of the grand prix.

NIEIR calculated the number of incremental visitors on the basis of ticket sales and surveys of patrons attending the event. NIEIR then applied the average amount spent by interstate and overseas visitors (once again, based on survey data) to the number of incremental visitors to derive total incremental expenditures. Total incremental expenditures by international and interstate visitors were estimated to be $73.9 million in 2005.

While this framework is sound, the robustness of the expenditure estimates turns on the accuracy of the attendance figures. However it is not possible to independently confirm their accuracy as attendance figures are based on non-verifiable data. Nevertheless, NIEIR's incremental visitor expenditure assumptions for both Scenario 1 and Scenario 2 were adopted.

B4.3 Increases in expenditure by attendees at the grand prix reducing savings to cover their grand prix expenditures

Based on survey results, NIEIR estimates that $11.6 million in grand prix expenditures by Victorian attendees were funded by reducing their savings. NIEIR argues that expenditures funded from a reduction in savings will impact positively on the economy[11]. This is because the extra spending by Victorians out of savings generates the same IO effects as spending by interstate and overseas visitors.

NIEIR provided additional justification for this assumption of reduced savings to finance grand prix-related expenditure by Victorians in response to audit's further inquiries. NIEIR also argued that Victorian household savings ratio had declined as a result of a greater choice in[12]:

- shopping hours
- recreational services (gambling)
- major events.

[11] NIEIR terms this the "enhanced resident expenditure effect".

[12] Department of Victorian Communities response dated 9 November to our initial queries forwarded on 31 July 2006.

There are additional reasons for the reductions in the ratio of savings to income. These include the lower cost and increased accessibility to debt. In addition, there have been wealth effects mainly through the increase in the value of owner-occupied housing and the share market. If expenditure by Victorians on the grand prix was the only factor causing a reduction in the savings ratio, then the use of the change in the ratio to support the assumption of enhanced expenditure on the grand prix may have merit. For these reasons, there are more substantial and persuasive reasons for the reduction in savings ratio. There is also a detailed discussion of this issue in Part 6 of this report.

The critical issue is whether grand prix-related expenditures would still occur if the grand prix was not to take place. If these expenditures were simply transferred to other activities in Victoria, then there can be no claim that these additional expenditures represent a new impact comparable with other impacts in the economic impact assessment such as the expenditures of interstate and international visitors.

There is no evidence for this enhanced resident expenditure effect other than the results of the survey question used by NIEIR that asked visitors whether they had drawn on their savings to finance their grand prix expenditures. The concept of savings for attendees in that context would most likely represent a response based on whether they had money available to fund their expenditures, or they had to incur debt.

The argument that attendees reduced their otherwise anticipated annual savings because of the grand prix would require considerably more theoretical and empirical evidence than that provided in the NIEIR report. An indication of the reduced confidence that NIEIR placed on this particular effect is that in the report NEIR uses a conservative multiplier of 1.55 to transform it into an estimate of GSP and employment.

Furthermore if savings intended to be spent in 2006 were in fact brought forward to 2005 because of the grand prix then this effect would have a depressing impact on the Victorian economy in 2006. A relocation of expenditure from one year to another cannot be considered as a net gain to Victoria.

Given this, the assumption of $11.6 million expenditure by Victorians financed by reduced savings is retained for Scenario 1 only. Under Scenario 2, the $11.6 million in savings-related expenditure is omitted. In the latter scenario, it is assumed that all expenditure by attendees from Victoria on the grand prix ($41 million) would have been spent in Victoria on other goods and services in the same year.

B4.4 Net export content of the grand prix

In staging the grand prix, the AGPC makes "out of state" purchases (negative impacts to Victoria) and receives revenues from other states (positive impacts to Victoria). The second column of Figure B3 was provided by the AGPC and used by NIEIR in its modelling. As B3 indicates, two items not directly reported include the "net outflows from the AGPC budget" and "net inflows from interstate into AGPC budget" (comprising interstate sponsorships received by the AGPC). The net figure of $-3.8 million is money leaking out of the state economy.

For modelling purposes, we have included an estimate of the net outflows based on available information and reasonable assumptions to determine a value for the net Victorian impacts. We assumed the value of net interstate sponsorships to be $2.2 million, which is the same as the Victorian sponsorship revenue amount retained in the state. On the basis of this assumption, audit's estimate of outflows from the AGPC budget is $-19 million (Figure B3)[13].

The other impacts assumed by NIEIR include:

- a positive impact of $10.8 million from the reduction in import spending as Victorians are now spending this money on the grand prix
- a positive impact of $2.2 million from the reduction in sponsorships that would have been spent in South Australia if the F1 grand prix was not held in Melbourne.

Figure B3
Import content of the grand prix ($m)

Item	NIEIR Analysis	Revised for Scenario 1 and 2
Net outflows from the AGPC budget	"A"	-19
Import content of Victorian resident expenditures	10.8	-
Net inflows from interstate into AGPC budget	"D"	2.2
Retained Victorian sponsorship revenue	2.2	2.2
Total	**-3.8**	**-14.6**

Source: Table 6.1 in National Institute of Economic and Industry Research 2005, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*. A report for the Australian grand prix Corporation.

As discussed later, the MMRF model has excluded the impact of $10.8 million arising from import substitution under both scenarios. This is because this impact is already determined within the MMRF framework. Consequently, a direct negative impact of $14.6 million (the net import expenditure arising from grand prix operations) is assumed under both modelling scenarios.

[13] Outflows are $-3.8 million and $-10.8 million. Inflows are $+2.2 million, and $+2.2 million. As Inflows must equal outflows it follows that "A" is $-19 million.

Retained expenditure in Victoria

NIEIR assumes that if the grand prix was not conducted in Victoria, it would have been staged in Adelaide. It was estimated that Victorians would have spent, in 2005, $17.7 million on the South Australian economy to visit such an event[14]. This assumption appears to be based on the fact that Adelaide hosted the grand prix prior to it being relocated to Melbourne. According to NIEIR, as the event is now hosted in Melbourne, Victoria benefits in 2005 by retaining $17.7 million in the state.

NIEIR treats this assumption as additional expenditure relating to the 2005 grand prix in the same manner as additional expenditure generated from interstate and international visitors who attend specifically for the event. Given that the grand prix has been based in Melbourne since 1996 and will be for the foreseeable future, the basis for the inclusion of retained expenditure as an assumption in the modelling is certainly contestable.

The retained expenditure impact of $17.7 million was included in Scenario 1, because that scenario is intended to replicate NIEIR's assumptions. Under Scenario 2, however, there is no retained expenditure impact in Scenario 2.

B4.5 Repulsion effects

NIEIR assumes that a number of Victorians departed the state in 2005 to avoid the grand prix. Based on community surveys, NIEIR estimates that $900 000 in expenditure was diverted from the state in 2005. While it was not possible to verify the accuracy of these surveys, these repulsion effects were included under both modelling scenarios.

B4.6 NIEIR assumptions that were excluded as inputs to MMRF modelling

Two of NIEIR's direct impact assumptions, the reduction in import expenditure by Victorians ($10.8 million) and the induced tourism effects ($9.1 million), were excluded as inputs to Scenario 1 and Scenario 2 MMRF modelling because:

- the calculation of the level of change to imports from expenditure by Victorians on the grand prix is implicit within the MMRF model
- induced tourism was included as an add-on after modelling by NIEIR. To ensure consistency and comparability of results, we have adopted a similar approach for Scenario 1
- for Scenario 2, induced tourism was excluded as an add-on as there is a concern over the quality of the estimate used by NIEIR.

[14] The expenditure estimate was based on a study of the 1992 Adelaide Grand Prix, which found that 53 per cent of all interstate visitors to that event were Victorians. At that time, Victorians spent $6.9 million on this event. A growth rate and CPI indexation was then applied to derive the 2005 amount. National Institute of Economic and Industry Research 1996, *Economic impact evaluation of the 1996 Transurban Australian Grand Prix*, prepared for the Department of State Development (Tourism Victoria).

The above points are described in further detail below.

Reduction in import expenditure

As discussed previously, NIEIR assumes that Victorians will reduce import expenditures by $10.8 million as people divert their expenditure towards the grand prix. This assumption implies that expenditures on the grand prix do not comprise any imports and NIEIR treats this reduction in imports as an exogenous stimulus.

For the purposes of MMRF modelling, the change to import composition arising from changes to Victorian expenditure patterns is not an exogenous input. Rather, in the MMRF model, any changes to imports arising from Victorians spending on the grand prix and less on other goods and services is determined by the model. If an explicit stimulus based on the reduction of imports was included, this would lead to double-counting. Consequently, this $10.8 million is excluded as a modelling input.

Induced tourism

The NIEIR report valued the induced tourism effect at $9.1 million which represents 8 per cent of total Victorian impacts from the grand prix[15].

The induced tourism effect is defined as the “additional tourism activity generated in the Victorian economy from interstate and international tourism as a result of the exposure to Victorian tourism attractiveness from the grand prix”[16]. This impact is restricted to net additional visitors to Victoria not associated with the grand prix.

Because of the absence of firm data, NIEIR estimated the induced tourism effect from the grand prix from an extrapolation of a 1990 estimate of induced tourism which may have resulted had Melbourne been successful in obtaining the Olympic Games. Both the basis for the original estimate and the assumptions adjusting this estimate to apply to the grand prix are tenuous leaving considerable uncertainty about the reliability of the final estimate of induced tourism. This was discussed in detail in Part 6 of this report.

Given these concerns, NIEIR’s induced tourism assumption of $9.1 million has been retained for Scenario 1 only as an add-on to the modelling results. On the other hand, if empirical research studies were conducted on the effects of either a significant major event such as the grand prix or a suite of major events on induced tourism, the outcomes from such a study could have been incorporated into the modelling of the most likely scenario with potentially altered results.

[15] National Institute of Economic and Industry Research, op. cit., p. 29.
[16] ibid.

B4.7 The NIEIR direct impacts and their use in the scenarios used for the MMRF modelling

Figure B4 summarises the direct impact assumptions for Scenario 1 ($87.7 million) and Scenario 2 ($58.4 million). The value of the direct impacts for Scenario 1 differs from the $107.6 million in direct impact reported by NIEIR; the difference being attributable to the exclusion of the import content reduction ($10.8 million) and induced tourism ($9.1 million) assumptions.

Further, the alternative scenario (Scenario 2) contains a more persuasive set of assumptions. It disregards the assumptions relating to expenditures funded from savings ($11.6 million), retained expenditures ($17.7 million) and induced tourism ($9.1 million).

In Scenario 1, the spending by interstate visitors and sponsors in Victoria ($43.7 million) and the increase in spending funded from savings ($11.6 million) are treated as increases in spending for the nation as a whole. That is, this expenditure was not diverted from other industries and jurisdictions. The total spending impact to Australia under this scenario is $70.9 million. This total comprises the net injections to the Victorian economy ($87.7 million) less the negative impacts to other states ($17.7 million to South Australia) plus an injection of $900 000 to other states caused by Victorians leaving the state for the grand prix.

For Scenario 2, the approach adopted was to assume that these Australian expenditures on the grand prix (that is, those by Victorians and people from other states) were funded by reductions in expenditures on other goods and services. In the case of interstate visitors, this means that their spending in Victoria led to equal sized reductions in spending in their home states. Thus, the net expenditure impact in Australia is the net of spending by international attendees less payments from AGPC budget (or $15.4 million).

Figure B4
Input assumptions: Direct impacts on Victoria ($m)

Item	Scenario 1	Scenario 2
Expenditure by additional non-local tourists -		
Interstate	34.4	34.4
Overseas	18.5	18.5
Sub-total	**52.9**	**52.9**
Expenditure by visitors prolonging stay -		
Interstate	1.5	1.5
Overseas	1.2	1.2
Sub-total	**2.7**	**2.7**
Expenditure by the media -		
Interstate	0.1	0.1
Overseas	2.3	2.3
Sub-total	**2.4**	**2.4**
Expenditure by drivers, teams and officials -		
Interstate	3.3	3.3
Overseas	12.6	12.6
Sub-total	**15.9**	**15.9**
Increase in expenditure by reducing savings -		
Victorians spending on the grand prix	41.0	41.0
Less: Victorians diverting their expenditure from non-grand prix industries	29.4	41.0
Sub-total	**11.6**	**-**
Net export content of the grand prix -		
Outflows from AGPC budget	(19.0)	(19.0)
Interstate sponsorships	2.2	2.2
Retained sponsorships	2.2	2.2
Sub-total (a)	**(14.6)**	**(14.6)**
Retained expenditure in Victoria -	**17.7**	**-**
Repulsion effects	**(0.9)**	**(0.9)**
Total direct impacts to Victoria	**87.7**	**58.4**

(a) Induced tourism of $9.1 million is excluded from the modelling as an input. However, as in NIEIR's approach, this amount will be an "add on" to the modelling output for Scenario 1.

Source: Commissioned study.

B5. MMRF modelling results

B5.1 Introduction

This section presents the wider economic effects of the 2005 grand prix to Victoria and Australia. The results are based on applying the direct impact assumptions described in section 3 to the MMRF model. These results are then compared against NIEIR's economic impact results.

B5.2 MMRF results

The macroeconomic results for the 2 scenarios using the MMRF model are summarised in Figure B5. NIEIR's results are also presented for comparative purposes. More detailed MMRF modelling results for individual Victorian industries are presented in Attachment A of this Appendix.

Figure B5
Modelling results

	Scenario 1 MMRF	Scenario 2 MMRF	NIEIR's IMP model
Victorian economic effects -			
Gross state product (GSP) ($m)	101.8	62.4	165.7
GSP plus induced tourism ($m)	110.9	62.4	174.8
Private investment ($m)	24.1	12.7	54.0
Private consumption ($m)	56.8	16.1	78.6
Public consumption ($m)	12.6	3.6	-
State tax receipts ($m)	11.9	3.5	15.2
Employment positions (no.)	600	400	3 650
National economic effects			
Gross domestic product ($m)	12.5	1.9	54.7
Private investment ($m)	2.3	-2.6	23.8
Private consumption ($m)	44.7	-5.9	9.2
Public consumption ($m)	9.0	-$1.7	10.3
National tax revenue ($m)	7.6	2.7	9.0
Employment positions (no.)	-	-	Not reported
Foreign export volume ($m)	-50.6	12.5	43.4
Foreign import volume ($m)	-3.6	-	-11.2
Current account balance ($m)	-56.5	-4.5	Not reported

Source: MMRF modelling results and National Institute of Economic and Industry Research 2005, *Economic impact evaluation of the 2005 Foster's Australian Grand Prix*. A report for the Australian grand prix Corporation.

Scenario 1: MMRF with NIEIR assumptions

In this scenario, the assumptions about the nature and size of the impacts used in the NIEIR report are adopted. Under this scenario, the grand prix shifts resources into Victoria, and as a result, the macroeconomic stimulus to Victoria is much larger than that to the nation as a whole.

Real GSP in Victoria increases by $101.8 million while real consumption is up by $56.8 million. There is also increased real investment (increasing by $24.1 million relative to base case values). An additional 600 full- and part-time jobs were created. The overall increase in foreign exports from Victoria is less than the direct stimulus to grand prix exports due to the real appreciation of the exchange rate, which puts downward pressure on other exports in Victoria.

In total, the 2005 grand prix was found to have a small positive impact on Australian real GDP, increasing by $12.5 million. The effect is small because the grand prix has relatively little impact on the supply side of the national economy. That is:

- employment by assumption is fixed
- there is little impact on the real cost of capital and hence on the stock of capital
- technological progress is unaffected.

In effect, the grand prix shifts expenditure around the economy, and does little to create new resources for production. National real consumption expands due to a fall in savings (as assumed by NIEIR) with private real consumption increasing by $44.7 million and public consumption increasing by $12.6 million, in line with the increase in net spending by local and interstate visitors.

Most of the increase in consumption is due to a reduction in savings rather than from increase in real income. Less national savings causes a weakening in the balance on the current account, deteriorating by $56.5 million relative to the base case value. This offsets almost exactly the increase in consumption, indicating that the grand prix has a negligible impact on national welfare.

Scenario 2: MMRF with certain of the NIEIR assumptions removed

In Scenario 2, net direct expenditure in Victoria is less than in Scenario 1 as it assumes that all expenditure by Victorians on grand prix-related goods and services is sourced by reducing expenditure in equal amounts on other goods and services. Moreover, the retained Victorian resident expenditure assumption is not included in this scenario.

As a consequence, the Victorian effects of the grand prix are smaller in Scenario 2 than in Scenario 1. The macroeconomic consequences for Victoria, however, remain positive, with real GSP up by $62.4 million, and real consumption increasing by $16 million. The number of new jobs created is around 400, compared with around 600 in Scenario 1.

In Scenario 2, the net expenditure increase in Australia is just the spending of international attendees, net of payments from AGPC budget ($15.4 million). As with Scenario 1, national real GDP is essentially unaffected, while national consumption falls slightly relative to its base case value. The latter result comes about because, contrary to the case in Scenario 1, there is no initial reduction in national savings to offset the negative consequences for consumption of the overseas payments.

The fall in consumption leads to a fall in real national domestic "absorption" relative to real gross domestic demand[17]. This allows for a small improvement in the trade balance. This is in contrast to Scenario 1 where, largely because of the initial fall in savings, the volume of net trade weakens. Despite the trade-account improvement in Scenario 2, the current account balance still deteriorates relative to its base case value, but by much less than in Scenario 1.

B5.3 Summary

The economic effects of the 2005 grand prix, as modelled using the MMRF model, are substantially lower than the effects projected under NIEIR's IMP model.

For Scenario 1, the increase to Victorian GSP is estimated to be $101.8 million, which is 39 per cent lower than NIEIR's estimate ($165.7 million). The employment effects to Victoria are also substantially lower (600 positions compared to NIEIR's 3650 positions). As the input assumptions are the same, the difference in the results in Scenario 1 and the NIEIR can be explained by the structural differences between the two models.

Scenario 2 omits the following impacts as inputs to the MMRF model:

- NIEIR's retained expenditure assumption ($17.7 million)
- the increase in Victorian expenditure on the grand prix financed from domestic savings ($11.6 million)
- induced tourism of $9.1 million.

The increase in Victorian GSP was estimated to be $62.4 million, which is 62 per cent lower than NIEIR's estimate. Similarly, the MMRF modelling results for private investment and private consumption were 76 and 80 per cent lower relative to NIEIR's estimate. These differences are explained by different input assumptions adopted, and the structure of the MMRF model.

[17] Absorption is defined as the sum of consumption, investment and government expenditure.

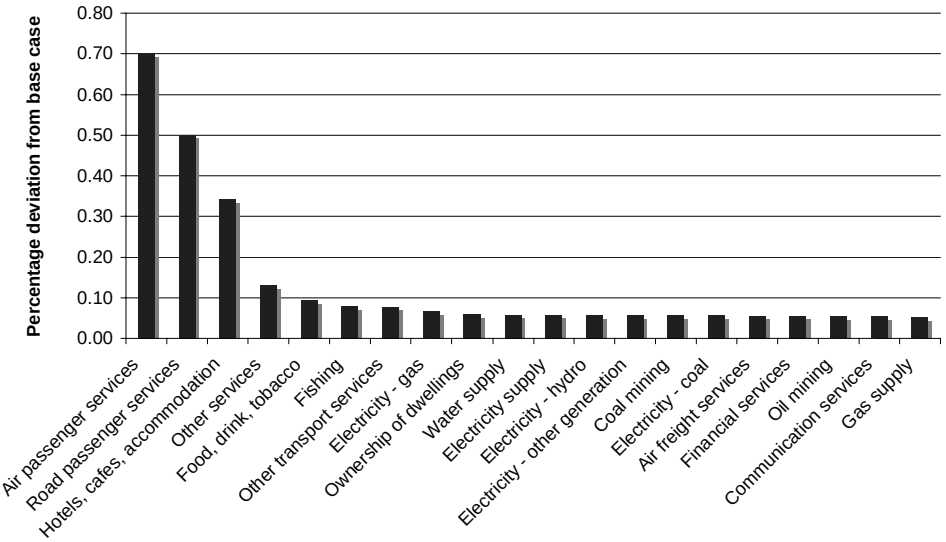
Attachment B1: Detailed MMRF modelling results

Industry value added

In Victoria, the industries that gain most from the grand prix are those that directly supply goods and services to attendees. Figure B6 shows percentage changes in industry real value added in Victoria for Scenario 1 for the top 20 impacted industries.

The industries that gain the most, in percentage terms are air passenger services, road passenger services, hotel, cafes and accommodation. All sell directly to attendees of the grand prix. Most industries gain output (relative to base case values) with no industry suffering a decline. This reflects, in the main, the presence of positive induced income effects (i.e. higher GDP leads to more consumer spending), which ultimately benefit all industries.

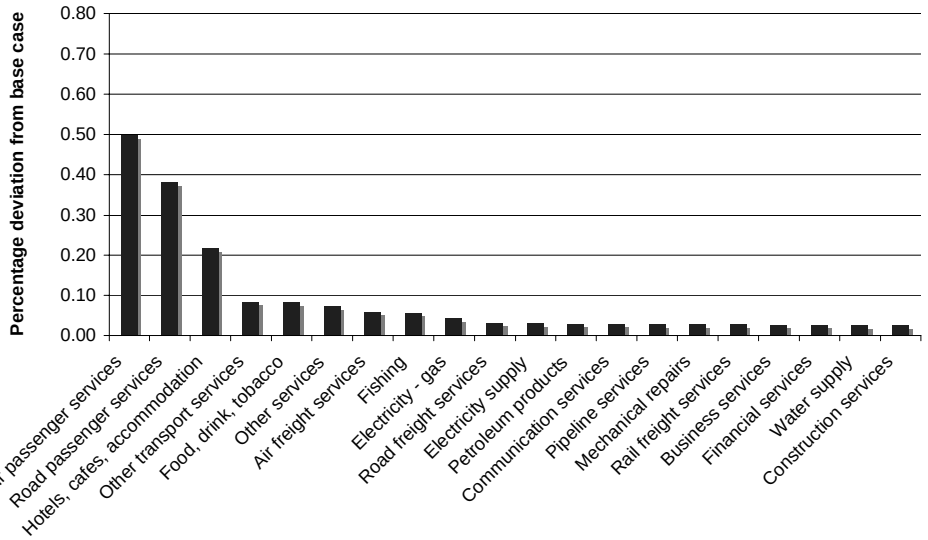
Figure B6
Industry value added, Victoria – Scenario 1



Source: MMRF modelling output - Top 20 ranked industries.

The outcomes for industry output and employment and for the statistical divisions in Scenario 2 (see Figure B7) are very similar in pattern to those in Scenario 1, but generally smaller in size in line with the relative outcomes for real GSP.

Figure B7
Industry value added, Victoria - Scenario 2

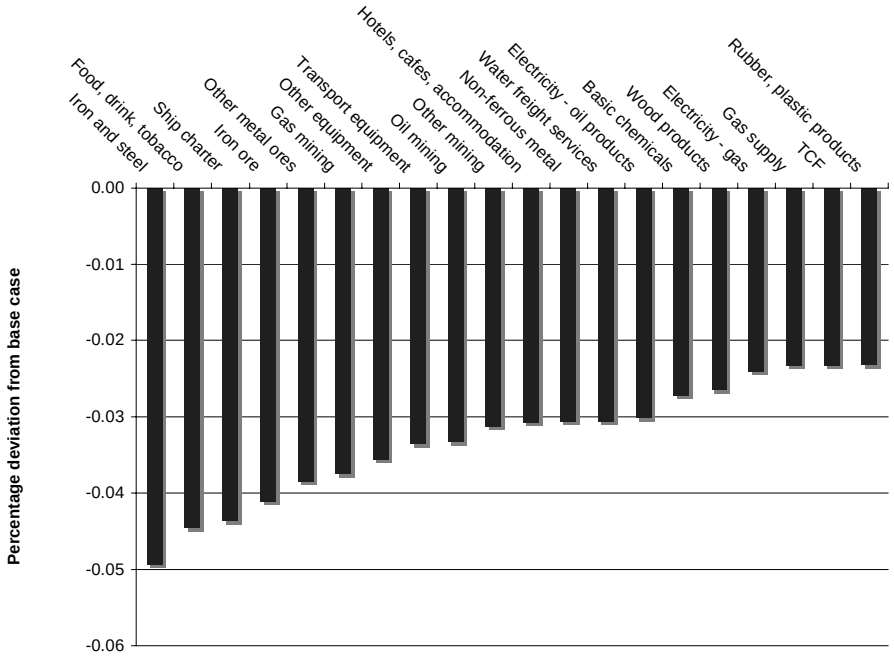


Source: MMRF modelling output - Top 20 ranked industries.

As for the rest of Australia, the grand prix crowds out activity in other industries. This is because the grand prix diverts expenditure into Victoria from elsewhere. This, combined with the negative effects of real appreciation on the competitiveness of traded-goods industries throughout Australia, are the main reasons underlying the crowding-out of activity in the rest of Australia.

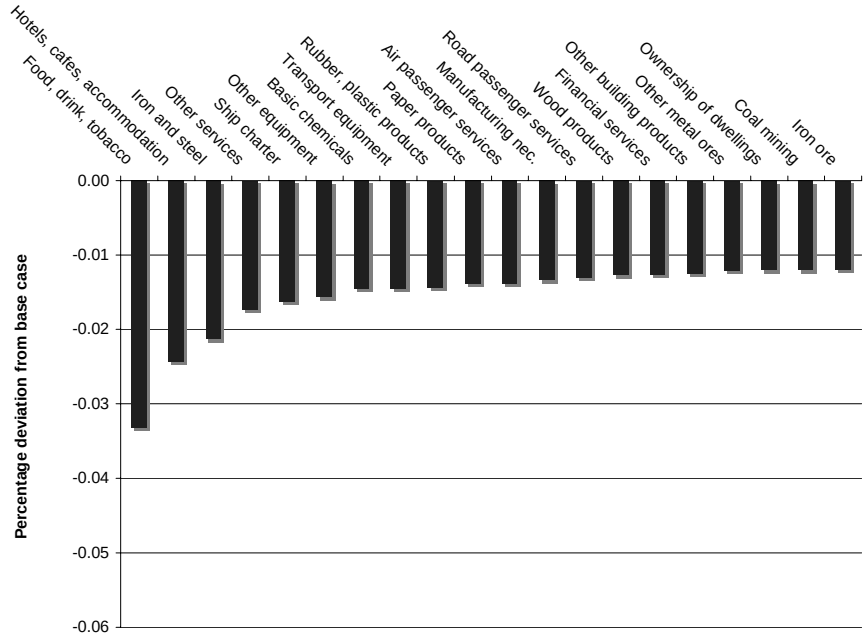
In Scenario 1 (Figure B8), the key industries impacted negatively in other states are iron and steel industry, food drink and tobacco, ship charter, and iron ore. The outcomes for industry output for industries in the rest of Australia in Scenario 2 (see Figure B9) are very similar in pattern to those in Scenario 1, but generally smaller in size in line with the more persuasive assumptions.

Figure B8
Industry value added, rest of Australia – Scenario 1



Source: MMRF modelling output - Bottom 20 ranked industries.

Figure B9
Industry value added, rest of Australia – Scenario 2



Source: <<>>.

Figure B10
Employment effects (percentage deviation from baseline), 2005

Industry	Scenario 1	Scenario 2
Air passenger services	0.58	0.50
Road passenger services	0.44	0.38
Hotels, cafes, accommodation	0.29	0.22
Other services	0.12	0.07
Food, drink, tobacco	0.11	0.08
Ownership of dwellings	0.09	0.02
Other transport services	0.09	0.08
Electricity - gas	0.09	0.04
Fishing	0.09	0.06
Water supply	0.06	0.03
Electricity supply	0.06	0.03
Air freight services	0.06	0.06
Electricity - other generation	0.05	0.02
Electricity - hydro	0.05	0.02
Electricity - coal	0.05	0.02
Coal mining	0.05	0.02
Financial services	0.05	0.03
Mechanical repairs	0.05	0.03
Communication services	0.05	0.03
Pipeline services	0.05	0.03
Construction services	0.05	0.02
Health services	0.04	0.01
Road freight services	0.04	0.03
Rail freight services	0.04	0.03
Oil mining	0.04	0.02
Wholesale trade services	0.04	0.02
Business services	0.04	0.03
Petroleum products	0.04	0.03
Government admin. and defence	0.03	0.01
Other mining	0.03	0.02
Forestry	0.03	0.02
Rail passenger services	0.03	0.02
Education services	0.03	0.01
Manufacturing nec.	0.03	0.01
Other building products	0.02	0.02
Gas supply	0.02	0.02
Retail trade services	0.02	0.01
Metal products	0.02	0.02
Non-ferrous metal	0.02	0.02

Figure B10
Employment effects (percentage deviation from baseline), 2005 - *continued*

Industry	Scenario 1	Scenario 2
Rubber, plastic products	0.02	0.02
Paper products	0.02	0.01
Crops	0.02	0.01
Printing, publishing	0.02	0.01
Cement	0.01	0.01
Other metal ores	0.01	0.01
Wood products	0.01	0.01
Livestock	0.01	0.01
Water freight services	0.01	0.01
Basic chemicals	0.01	0.01
Gas mining	0.00	-0.01
Iron ore	0.00	0.00
Electricity - oil products	0.00	0.00
Transport equipment	0.00	0.01
Other equipment	0.00	0.01
TCF	-0.01	0.00
Iron and steel	-0.01	0.00
Ship charter	-0.06	-0.01

Source: MMRF modelling output.

As Figure B10 indicates, the key industries in Victoria that experienced an increase relatively high increases to employment (in percentage terms) arising from the Formula 1 grand prix are air passenger services, road passenger services, and hotels, cafes, accommodation under both scenarios.

Regional employment

Within Victoria, most of the additional activity is located in the Melbourne Statistical Division with relatively small spill-over effects to other statistical divisions under both scenarios. In terms of employment, approximately 90 per cent of the employment increase in Victoria arising from the grand prix occurs within the Melbourne metropolitan region. In percentage change terms, employment in Melbourne increased by 0.06 per cent and 0.04 per cent for Scenario 1 and Scenario 2, respectively, (see Figure B11).

Figure B11
Increase in employment relative to baseline (percentage growth)

Region	Scenario 1	Scenario 2
Melbourne	0.064	0.041
Barwon	0.012	0.010
Western District	0.018	0.015
Central Highlands	0.013	0.011
Wimmera	0.016	0.014
Mallee	0.016	0.013
Loddon Campaspe	0.017	0.014
Goulbourn	0.019	0.015
Ovens Murray	0.014	0.011
East Gippsland	0.017	0.014
Gippsland	0.016	0.011

Source: MMRF modelling output.

The Department of Premier and Cabinet response to the commissioned studies

RESPONSE provided by the Secretary, Department of Premier and Cabinet

DPC has a number of concerns around the CGE and CBA assessments of the 2005 Grand Prix.

As described in the report, the two assessments appear to make fundamentally different assumptions about the capacity of Australian workers to supply labour to support the delivery of the Grand Prix. The reason for this inconsistency has not been explained. Further, it is not apparent that any attempt has been made in the cost-benefit analysis to incorporate the countervailing effects on the costs of other Victorian businesses from the transfer of labour in the case where there is no spare capacity.

In our view both models also erroneously exclude the longer term benefits of brand value, be that in the form of induced tourism or other benefits to Victoria, from major events. Brand value improvement is a principle that underpins Victoria's major events strategy. Evidence is difficult to find in the particular case of the 2005 Grand Prix and we accept the point that more research is warranted. Research has nevertheless been undertaken in respect of other major events around the world, with evidence pointing to positive economic benefits. It should also be acknowledged in the report that simply because specific evidence is unavailable does not mean a certain effect does not exist.

DPC also questions the assumption made in the CGE modelling assessment that sets the retained expenditure effect at zero. It is highly probable that some people who like to attend the Grand Prix do so because they prefer to attend the Grand Prix to other entertainment options and so will continue to do so if the event is held outside Victoria.

The cost-benefit analysis in our view also wrongly excludes any benefits to Victoria beyond 2005. There are a number of other benefits that we believe have been understated or excluded from the cost-benefit analysis including: Victoria's share of the benefits from the collection of additional taxes from interstate and international visitors; civic pride and other non-use values; and benefits to Melbourne's reputation as a transport hub.

FURTHER comment by the Auditor-General

The two commissioned studies are subject to some important caveats and these are set out in the report. Due to basic methodological differences, cost benefit analysis and CGE modelling results are never directly comparable. The two commissioned studies are internally consistent and their respective assumptions were considered appropriate for their particular methodology. Care was taken to ensure that costs and benefits were only included where a defensible numerical value could be assigned to the cost or benefit.

It is noted that the CGE modelling assumes that the 2005 Grand Prix did not lead to more employment in Australia over the whole of 2005. Consistent with this assumption is that the Grand Prix could lead to more employment in Victoria over the whole of 2005, and indeed the modelling under the most likely scenario estimated an additional 400 jobs in Victoria. This extra employment in Victoria was not just in industries directly affected by the Grand Prix, but throughout the whole Victorian economy.

The CBA assumes that it was possible that additional employment in the industries directly affected by the Grand Prix such as the accommodation and restaurant sectors (the CBA deals only with direct effects) could have been drawn from the unemployed or the part time workers increasing their hours of work. This is consistent with the CGE modelling, because the CGE modelling allows for extra employment to be created in Victoria as a result of the Grand Prix. There is nothing in the CGE modelling that states that the extra employment generated at and around the time of the Grand Prix (March 2005) could not have come from spare labour resources in Victoria.

Audit acknowledges that brand value improvement is in-principle a possible source of benefits from hosting major events. The most tangible outcome of enhanced brand value is induced tourism; the additional tourists that come to Victoria subsequent to an event as a result of their positive exposure to Melbourne. Efforts were made to source credible quantitative estimates of induced tourism for inclusion in the analysis however we are aware of no studies that can be used to measure the induced tourism effects for an event such as the Grand Prix. This absence of research is also stated in the economic evaluation conducted by the National Institute of Economics and Industry Research on the 2005 Formula 1 Grand Prix. While no such estimates are available at this time, there is scope for the inclusion of such estimates in future economic analyses of major events if supported by empirical research.

In respect to the comment "some people who like to attend the grand prix do so because they prefer to attend the grand prix to other entertainment options and so will continue to do so if the event is held outside Victoria", an alternative scenario around consumer behaviour is that people have a discretionary entertainment budget and, if there was no grand prix in Melbourne, it would most likely be spent on other entertainment in Victoria.

FURTHER comment by the Auditor-General - continued

The assumption of leakage of spending from Victoria if the grand prix was held elsewhere as part of the retained Victorian resident expenditure effect does not, in practice, result in the creation of a positive spending impact flowing from the 2005 event itself. As noted above, the Grand Prix has been held in Melbourne since 1996 and will continue to be run in Melbourne in the foreseeable future. This effect is based on speculation about the future location of the event and how consumers would behave if the event was no longer in Melbourne. For these reasons, we have excluded this assumption from the modelling of the 2005 grand prix.

It is reasonable to assume that the benefits from a 4 day event would overwhelmingly be felt during the event and in the year the event was held. The report acknowledges there are a range of non-use values such as civic pride but there are difficulties in assigning a monetary figure to these values. If these values are referred to in a cost benefit analysis, it is usually in a qualitative rather than quantitative sense. This is consistent with their treatment in this report.

Attachment B2:

NIEIR's response: Performance Audit State Investments in Major Events Preliminary Material provided for checking of facts

Prepared for the
Auditor-General Victoria

By the
National Institute of Economic and Industry Research
ABN: 72 006 234 626
416 Queens Parade, Clifton Hill, Victoria, 3068
Telephone: (03) 9488 8444; Facsimile: (03) 9482 3262
Email: admin@nieir.com.au

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NIEIR

NIEIR Research Foundation

National Institute of Economic
and Industry Research Pty Ltd
ACN 006 234 626
ABN 72 006 234 626

416 Queens Parade
Clifton Hill VIC 3068
Australia

Email address
admin@nieir.com.au
Web address
http://www.nieir.com.au/

Telephone
61 3 9488 844
Facsimile
61 3 9482 326

1 May 2007

Mr D.D.R. Pearson
Auditor General
Victorian Auditor General's Office
Level 24
36 Collins Street
MELBOURNE VIC 3000

Dear Mr Pearson,

Re: Performance Audit of State Investments in Major Projects

I acknowledge receipt of your proposed report on State Investment in Major Events which is expected to be tabled in Parliament later this month. I note that you have largely ignored comments made in my letter of 14 March. It is fairly clear that the approach you have taken to this audit is driven by subjective issues of ideology and preference rather than objective considerations. As a result, I do not see any point responding further to you directly.

I require that this letter and the attachment to my letter of 14 March be included in your final report. This will make it clear to the reader, by comparing your final report with my original 14 March response to your Department, the dismal efforts you have made to "check the facts" of the matter. When ideology and prejudice are motives, the facts do not matter.

The *Audit Act 1994* provides authority for the Auditor General to, inter alia:

- conduct annual financial statement audits of public sector agencies;
- undertake performance audits within the public sector which encompass assessments of the economy, efficiency and effectiveness of the management of public resources by the government or individual agencies of government;
- examine the use of public grants received by both private and public sector organisations[1].

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[1] http://www.audit.vic.gov.au/abt_role_of_ag.html

By effectively calling for a boycott of economic evaluation using input/output models you have both exceeded both your mandate and your competence. You have failed to understand that any model can be made to be constrained to a full employment outcome, not just CGE models. The question is, whether or not this is an appropriate assumption. You have failed to provide adequate justification for such a call other than that you believe one model is better documented than another and, by implication, you prefer one set of numbers over another.

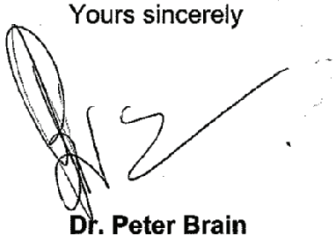
The claim that one model is better documented than another is wrong. The documentation of the IMP model clearly spells out not only its structure, but its superiority in terms of representing the actual economy over a CGE model.

Many of the observations contained in your report are perfectly consistent with the mandate provided by the Parliament. It is appropriate for you to question assumptions, methodologies and practices. However many of your conclusions are not well thought out and based on no, or flimsy, evidence. This reckless approach has significant financial and economic consequences for the State.

I enclose for your benefit, a copy of the most important of my three books that sets out the structure of the IMP model and challenges the approach adopted by GCE models such as the one used by your office. I hope you enjoy this reading in preparation for the public debate that will inevitably follow the release of your report. It is regrettable that release of the report in its current form will inflict harm on the reputation of the important office which you only recently inherited.

The competence would be questioned of any Auditor-General who recommended that Governments should assume that the overwhelming bulk of their decisions will result in not one hour of additional work being made available to their residents, either now or any time in the future. The core implication of your recommendations is that Government in Victoria is largely pointless.

Yours sincerely



Dr. Peter Brain
Executive Director

Encl.

1. General response

Having read the material for the general checking of facts (hereinafter referred to as the draft report), NIEIR believes that the findings in terms of the economy-wide impact of event evaluation, have no foundation in fact in terms of the structure and dynamics of the Victorian economy in 2005, years before 2005, and any year for the foreseeable future.

Further, because of gross errors in the assumptions made, the analysis (in terms of other issues of programs and policy) leads to absurd conclusions.

The responsibility for the report lies with the Auditor-Generals Department. In relation to the issues addressed in this response, it is clear that the Department has gone well beyond its level of competency.

There are a number of aspects of the report that contain gross errors. These will be addressed in turn. However, the appropriate place to start is the core issue and the core error revolving around the issue of resource constraints and, in particular, the full employment of labour assumptions adopted by the Auditor-General. This issue is central to the analysis and will be considered first.

Since the issues are common to all events, the reference point in this response will be the evaluation of the Australian Formula One Grand Prix (AFOGP).

The Draft Report uses the MMRF model to evaluate the direct impacts estimated by NIEIR for the 2005 AFOGP. The model estimates the impact on Victorian gross state product to be $101.8 million, or 39 per cent, lower than NIEIR's estimate and $62.4 million, or 62 per cent, below the NIEIR estimate if three categories of NIEIR estimated direct effects are excluded. The lower estimate is accepted by the Auditor-General as the preferred estimate.

The estimates are then put forward to be more accurate because of "more realistic input assumptions and structure" of the MMRF Model. The MMRF is a class of models known as Computerised General Equilibrium, or CGE, models.

The key foundation stone in the claim is that the MMRF offers a more realistic estimate of the economy-wide benefit of the AFOGP is the fact that in 2005, the year of the AFOGP under evaluation, the MMRF modelling approach assumes full employment of labour. Otherwise they are talking about some undefined year in the long term which by definition we don't know anything about now. No facts or empirical justification are presented to support this assertion whatsoever. It is simply assumed. The fact of the matter is that when the assumption is tested for empirical validity, it is found that there is not a shred of evidence to justify it. Once the assumption of full employment of labour is removed the long-run MMRF model reduces to a basic input-output model, an outcome detested by the modellers. Hence the essential importance of the issue in the correction of errors.

The other interpretation is that the Auditor-General is talking about some undefined year in the long term, which by definition we don't know anything about now and therefore cannot make any assessment of its impact on the economy. This would make the analysis complete nonsense. The main stimulus from the event is over within a quarter or two.

If this major error is corrected then it is obvious given the already strong effects that MMRF shows on the Victorian economy, despite errors in assumptions, that the impact of the AFOGP from a error corrected MMRF model would be greater than estimated by NIEIR especially in the key issue of Government revenue.

2.1 What does the MMRF's full employment assumption imply?

The first step in understanding the unrealistic nature of the MMRF model's full employment assumption in 2005 is to understand what it implies. It implies that labour is fully utilised at the national level, which in turn implies that labour is fully utilised at the State level and at the sub-state or regional level.

It also implies that there cannot be any increase in output in any State unless labour is attracted from other States.

In terms of Victoria, this means in March 2005 the Victorian economy had no capacity to increase labour input from Victorian residents. That is, there was no capacity to increase labour supply from:

- full-time workers working extra overtime;
- part-time workers working longer hours;
- the unemployed gaining access to employment; or
- those not in the workforce being tempted back into the workforce by the increased availability of employment.

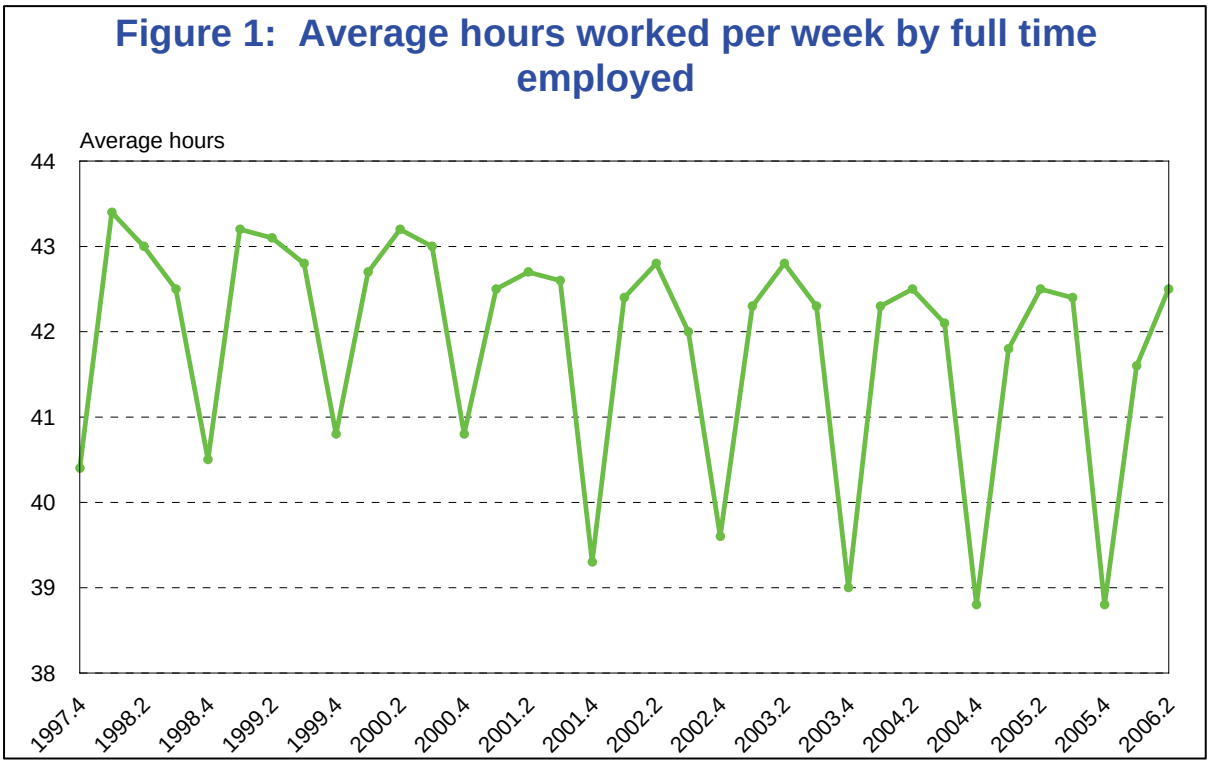
This is obvious nonsense.

2.2 For the MMRF resource constraint to be realistic one would expect the average hours worked by the full-time employed around March 2005 to be near the highest on record. This is not the case.

Figure 1 shows the average hours worked by full-time employed. The average hours worked in the March quarter 2005 is below the average hours of previous quarters. In the March quarter 2005 an extra hour per week could have been extracted from the full-time workforce and still be within historical benchmarks. An extra hour per week over four weeks would have supplied 6.8 million hours, 3,238 annual full-time equivalent workers, or greater than the NIEIR annual equivalent increase of 3,650, that is an annual equivalent full-time increase of 3,011.

The required labour supply could have come from the above source alone to support the AFPGP from Victorian resources. This is taking things to extreme, but it is reasonable to expect that at least around 15 to 20 per cent of the labour requirements would have come from increased hours worked by full-time employed.

Figure 1: Average hours worked per week by full time employed



2.3 For the MMRF model assumptions of resource constraint to be realistic one would expect to find in surveys of the Victorian workforce that no part-time workers would be willing to work longer hours. This is not the case.

The Australian Bureau of Statistics (ABS) surveys Victorian employees each year to assess the under-employment of part-time workers. In the most recent survey the ABS found that there were 144,600 Victorian part-time workers who would prefer more hours and 123,000 were available to start work with more hours.

2.4 For the MMRF model assumption of resource constraints to be realistic, one would expect to find no persons not in the workforce who would want to work (that is, no discouraged workers) and/or Victoria's participation rate to be around the highest in the world, that is at saturation point. This is far from the case.

If the Victorian participation rate is not amongst the highest in the world, then for the MMRF assumption is to have any validity, it would be expected that the participation rate in Victoria be unrelated to the employment rate. From the IMP model, between 40 and 60 per cent of the employment resources to support any event expansion would come from increases in the participation rate. That is, those who would have remained outside the workforce in the absence of the event. A key segment here is students who would have worked less hours in the March quarter in the absence of the event.

The MMRF "realistic" assumption that there are no people in Victoria who are outside the workforce and who want to work is, of course, nonsense. The ABS in 2005 found that there were 304,000 people not in the workforce who wanted work (ABS 6220.0).

The hypothesis that the participation rate in Victoria is at near saturation level also has no foundation. Figure 2 indicates that the Australian (and hence the Victorian participation rate which is close to the national level), is significantly below the participation rate in a number of countries, in particular Canada and to a lesser extent the United States. Canada's is 78.2 and the United States' is 75.4 compared to Australia's 73.6. It should be noted that the population for the denominator in the participation rate in Figure 3 is the OECD estimate based on the population aged 15 to 64 compared to the measurement by the ABS for Australia and the states which is the population aged 15 and over.

More importantly, the cross section regression of the data in the figure yields the following result:

$$PR = \underset{(4.4)}{14.96} + \underset{(14.5)}{0.8498}\, ER \qquad R^2 = 0.91$$

Where:

PR = participation rate;

ER = employment rate.

This implies that the majority of the increase in employment for an event would come from changes in the participation rate.

The corresponding time series result for Victoria is:

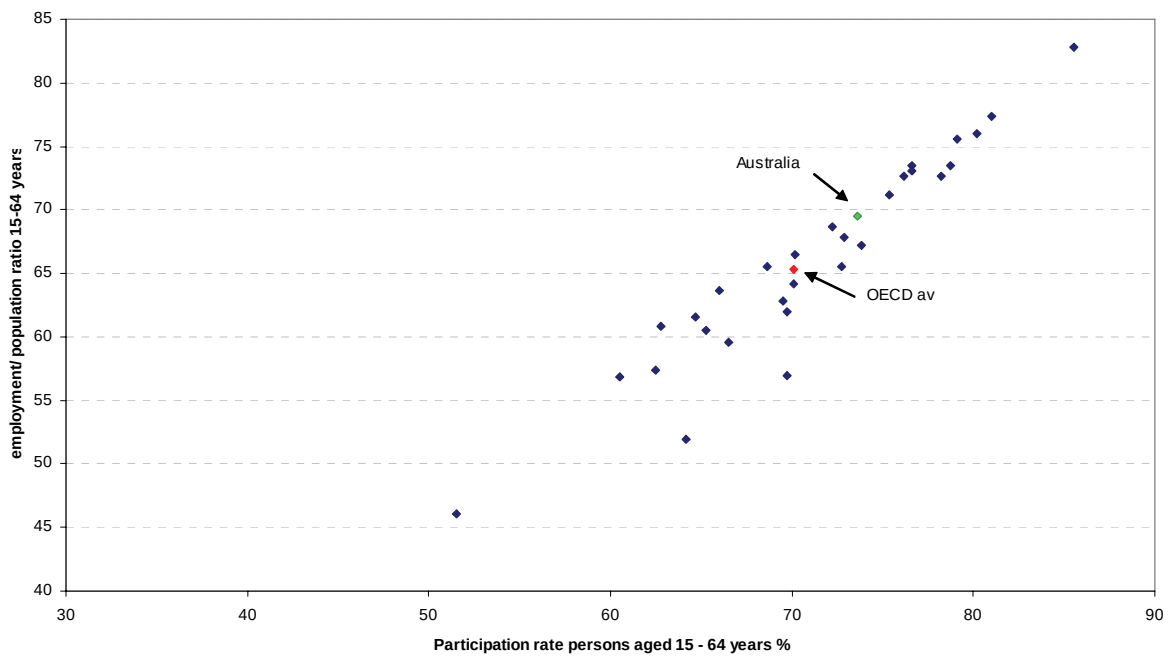
$$PR_t - PR_{t-4} = \underset{(1.2)}{0.0502} + \underset{(13.5)}{0.4561} * (ER_t - ER_{t-4}) \qquad R^2 = 0.81$$

Time period 1981.2 – 2005.3

The Victorian coefficient is what is standard in IMP model results.

The facts are clear. At least 40 per cent of the employment resources to support an event will come from changes in the Victorian participation rate.

Figure 2: Participation rate and rmployment to population ratio OECD countries



2.5 For Australia to be at full employment in 2005 it would be expected that the unemployment rates across Australian regions would have reached a stable and common low level.

The MMRF model, in the form of its predecessor the ORANI model, has been applied in Australia since the mid 1970s. Over the lat 30 years the full employment assumption has been applied numerous times, irrespective of the actual unemployment rate. That is, when the unemployment rate was 5 per cent in the 1970s and when the unemployment rate reached double digit levels in the early 1990s. The history suggests that the MMRF users simply define full employment at whatever the actual unemployment rate is.

So it is for the AFOGP. In March 2005 the State unemployment rates (in per cent) were:

New South Wales	5.8
Victoria	5.6
Queensland	4.8
South Australia	5.3
Western Australia	5.2
Tasmania	6.2
Australian Capital Territory	6.0
Northern Territory	3.7

This is a reasonably wide variation. The point is clear. Somehow a 6.2 per cent unemployment rate in Tasmania is a full employment rate, while a 3.7 per cent unemployment rate represents full employment in the ACT. Again, whatever the actual unemployment rate, the MMRF model simply assumes that rate represents the full employment rate.

2.5.1 The core problem for those wishing to use the actual unemployment rate as an indicator of full employment is that the actual unemployment rate cannot be used for this purpose.

NIEIR has, for eight years in its ALGA/NIEIR "*State of the Regions*" reports, been measuring unemployment rates at the State and regional level. As any competent economist would know, the official unemployment rate is corrupted and under-estimates the actual unemployment rate, as NIEIR has highlighted over and over again.

The reasons are straight forward. The first is the tactic adopted by the then government in the face of the 1991 recession to shift as many people as possible from the unemployment rolls to other forms of working age social security support, namely disability pensions, training allowances, etc. This tactic has been maintained though with reducing vigour to this day.

The second strategy to reduce the measured unemployment rate is to encourage working age social security beneficiaries to seek a few hours of work a week. This has been the tactic favoured by the current administration. This reduces the unemployment rate because to be counted as employed in the labour force statistics a person has only to have worked for one hour or more a week, in some cases as unpaid employment.

The actual unemployment rate, therefore, cannot be used as an indicator of full employment because under the current circumstances the actual unemployment rate could indicate zero unemployment, while the actual effective unemployment rate was 100 per cent, simply because everybody was working one hour.

Under the current circumstances, the only way of obtaining a correct estimate of the actual unemployment rate is to use social security working age beneficiary data and construct an unemployment series from these sources.

This is what NIEIR does in the "State of the Regions" reports and the definition of NIEIR's unemployment and structural unemployment rates are given in Appendix A. The focus below is on the NIEIR unemployment rate, not the NIEIR structural unemployment rate, which includes clearly less employment ready persons.

2.5.2 Realistic estimates of the unemployment rate across Melbourne indicates that Melbourne is a long way from full employment, either in 2005 or any year for the foreseeable future.

Table 1 and the figures show a wide variation in NIEIR unemployment rates. Under MMRF assumptions, Dandenong has full employment at 19 per cent, while for Inner Melbourne it is 3.1 per cent. This is nonsense. The reason why Dandenong has such a high unemployment rate and Inner Melbourne a low one, is that if one is unemployed it is impossible to live in Inner Melbourne for any length of time. High rents and cost of living would force exit from the region. This is why the unemployed have to congregate in fringe sub-regions where rents, cost of housing and general cost of living are lower.

The key point is that around March 2005 there would have been around 270,000 reasonably job-ready unemployed people.

Table 1 Melbourne Statistical Local Areas: NIEIR unemployment rate (percent)			
	2001	2006	Change in social security rate 2006-2001
Melbourne (C) – Inner	3.6	3.1	-0.5
Melbourne (C) – Southbank-Docklands	4.9	4.6	-0.2
Melbourne (C) – Remainder	13.5	8.8	-4.8
Port Phillip (C) - St Kilda	13.7	10.9	-2.8
Port Phillip (C) – West	10.1	8.9	-1.2
Stonnington (C) – Prahran	7.9	6.5	-1.4
Yarra (C) – North	16.3	13.5	-2.8
Yarra (C) – Richmond	13.5	11.3	-2.2
Brimbank (C) – Keilor	13.7	13.8	0.2
Brimbank (C) - Sunshine	22.9	21.7	-1.2
Hobsons Bay (C) - Altona	15.2	13.3	-1.9
Hobsons Bay (C) - Williamstown	12.2	10.5	-1.7
Maribyrnong (C)	21.3	17.6	-3.6
Moonee Valley (C) - Essendon	11.7	10.5	-1.2
Moonee Valley (C) - West	10.8	9.6	-1.2
Melton (S) – East	9.7	8.0	-1.7
Melton (S) Bal	14.8	10.7	-4.2
Wyndham (C) – North	11.4	9.6	-1.8
Wyndham (C) - South	12.7	9.8	-3.0
Wyndham (C) – West	11.8	10.4	-1.3
Moreland (C) - Brunswick	15.9	12.5	-3.4
Moreland (C) - Coburg	15.6	13.5	-2.0
Moreland (C) – North	18.0	16.5	-1.4
Banyule (C) - Heidelberg	10.7	10.2	-0.5
Banyule (C) – North	8.4	7.7	-0.7
Darebin (C) - Northcote	15.3	11.8	-3.5
Darebin (C) – Preston	19.7	17.3	-2.5
Hume (C) - Broadmeadows	21.9	18.4	-3.5
Hume (C) - Craigieburn	10.1	13.1	2.9
Hume (C) – Sunbury	9.2	8.8	-0.3
Nillumbik (S) – South	4.6	4.0	-0.5
Nillumbik (S) – South-West	5.6	4.8	-0.8
Nillumbik (S) Bal	5.2	4.5	-0.7
Whittlesea (C) - North	8.4	11.5	3.1
Whittlesea (C) - South	14.6	12.9	-1.7
Boroondara (C) - Camberwell N.	4.0	3.9	-0.1
Boroondara (C) - Camberwell S.	5.8	5.3	-0.5
Boroondara (C) - Hawthorn	5.7	4.5	-1.3
Boroondara (C) - Kew	7.6	5.1	-2.5
Manningham (C) - East	3.7	3.6	-0.2
Manningham (C) - West	6.5	5.9	-0.6
Monash (C) - South-West	10.7	8.9	-1.8
Monash (C) - Waverley East	6.5	5.7	-0.8

Table 1 Melbourne Statistical Local Areas: NIEIR unemployment rate (percent) – continued			
	2001	2006	Change in social security rate 2006-2001
Monash (C) - Waverley West	7.1	6.3	-0.8
Whitehorse (C) – Box Hill	7.4	6.7	-0.7
Whitehorse (C) - Nunawading E.	7.7	7.2	-0.5
Whitehorse (C) - Nunawading W.	8.5	8.2	-0.3
Knox (C) – North	9.3	8.5	-0.8
Knox (C) – South	6.8	7.1	0.3
Maroondah (C) – Croydon	10.3	10.2	0.0
Maroondah (C) – Ringwood	9.5	9.3	-0.2
Yarra Ranges (S) – Central	16.1	15.0	-1.2
Yarra Ranges (S) – North	13.6	12.4	-1.2
Yarra Ranges (S) - South-West	9.4	8.3	-1.1
Bayside (C) – Brighton	4.5	4.0	-0.5
Bayside (C) – South	7.4	6.7	-0.7
Glen Eira (C) – Caulfield	8.6	7.0	-1.6
Glen Eira (C) – South	10.4	9.3	-1.0
Kingston (C) – North	10.5	8.9	-1.6
Kingston (C) – South	11.3	10.1	-1.2
Stonnington (C) – Malvern	6.0	5.4	-0.6
Gr. Dandenong (C) - Dandenong	19.6	19.0	-0.5
Gr. Dandenong (C) Bal	17.4	15.9	-1.5
Cardinia (S) – North	8.6	5.9	-2.7
Cardinia (S) – Pakenham	11.2	11.9	0.7
Cardinia (S) – South	15.7	10.9	-4.8
Casey (C) – Berwick	7.9	8.2	0.3
Casey (C) – Cranbourne	13.2	13.2	0.0
Casey (C) – Hallam	13.3	11.0	-2.4
Casey (C) – South	10.7	9.6	-1.0
Frankston (C) – East	10.7	11.4	0.7
Frankston (C) – West	16.8	15.1	-1.7
Mornington Peninsula (S) - East	11.1	10.0	-1.2
Mornington Peninsula (S) - South	18.3	15.0	-3.3
Mornington Peninsula (S) - West	8.9	8.3	-0.6

Definition: Number of work age persons receiving social security payments whether unemployment benefits, disability benefits or other categories of benefits divided by the working age population.

Figure 3: Melbourne Statistical Local Areas – 2001 NIEIR unemployment rate (per cent)

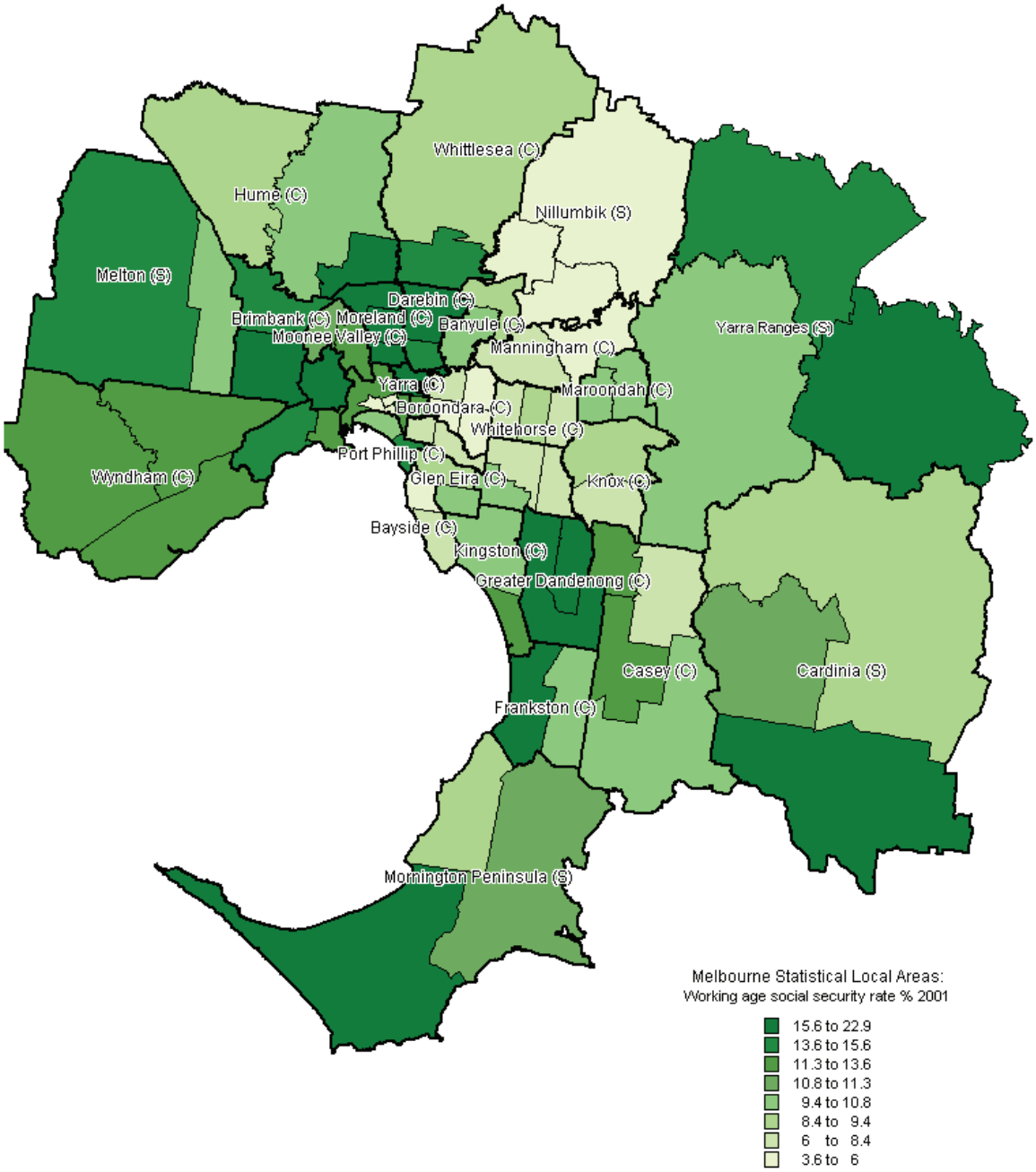
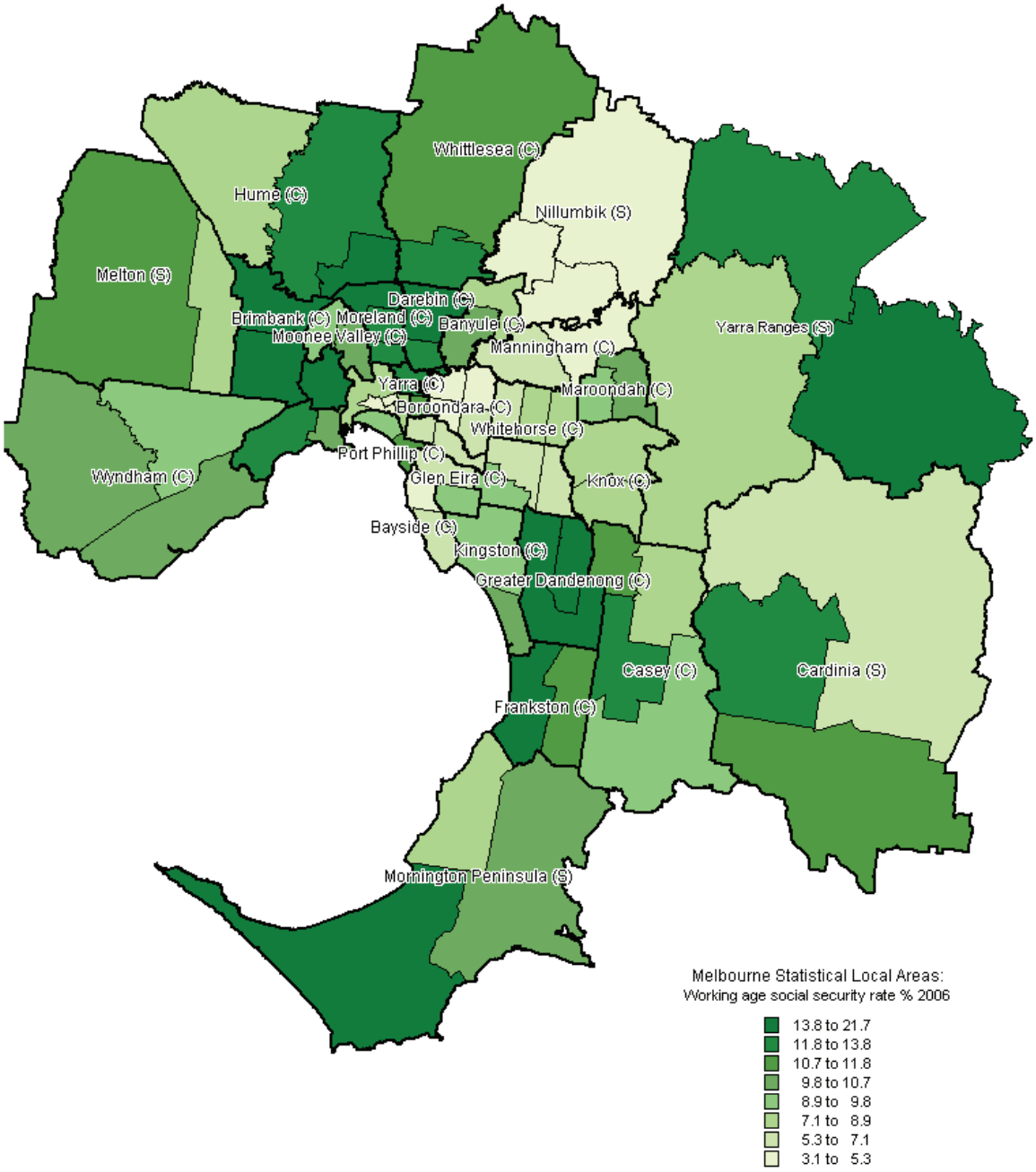


Figure 4: Melbourne Statistical Local Areas – 2006 NIEIR unemployment rate (per cent)



2.6 Rather than the fiction of no employment ready personnel in Victoria, around March 2005 the fact is that between 0.5 and 0.75 million Victorians would have been available to support the employment requirements of the AFOGP.

The 0.5 to 0.75 million estimate is based on aggregating the NIEIR unemployed, the part-time who want extra hours, those outside the workforce who want employment, with the balance supplied by full-time workers who would be willing to work extra overtime. The lower end of the range is obtained by discounting some of the ABS estimate of the not in workforce segment who want work because there may be an element of this group also being captured in the NIEIR unemployment estimate.

3. There is a simple factual test for the MMRF results. Did Victoria for every 1,000 additional employment positions created have to import (via interstate migration) an additional 2,000 people in 2005?. The fact is that in 2005 an additional 1,000 employment positions created at the margin required 43 people, consistent with NIEIR view that the AFOGP met its labour requirements mainly from Victorian labour resources.

The assessment that there would be around 0.5 to 0.75 million people in Victoria eligible to take up work generated by the AFOGP can be tested in another way. The 0.5 to 0.75 million people were estimated from the bottom up. However, a top down test can be easily carried out.

In the MMRF Model for Victoria to be able to supply the labour to support the event it is necessary for Victoria to be able to secure the labour interstate. Since employed persons come with partners and dependents, it would be reasonable to assume that the MMRF model results implies that at the margin every additional employment position created in 2005 required an interstate migration increase of 2.

The following equation was estimated, namely:

$$\frac{NIS}{POP15+} = \underset{(4.1)}{-0.6129} + \underset{(3.9)}{1.991} \,.\, (EMPV/POP15+) - \underset{(3.8)}{1.674} \,.\, (EMPV/POP15+)^2 + \underset{(6.5)}{0.0173}\, RHP + \underset{(10.4)}{0.000071}\, Time \qquad R^2 = 0.85$$

Where:

NIS = Sum of net interstate migration into Victoria for the current quarter and the previous three quarters.

POP15+ = Population aged 15 and over.

EMPV = Number of people employed in Victoria.

RHP = Established house prices in Victoria relative to rest of Australia.

Time = Time trend.

The equation is non-linear in that the higher the employment to population ratio, the greater proportionality will be the net immigration rate. It is of the form required to fully test the MMRF assumption. A linear model would simply not do.

The general form to the equation is in line with MMRF assumptions. However when the data for March quarter 2005 is plugged into the equation and the employment level is increased by 1,000, the increase in net interstate migration into Victoria would be 43. This is near the IMP model result, although the equations in the IMP model are more lagged and linear.

The top down approach, like the bottom up approach, shows the "realistic" labour market assumption of the MMRF model to be pure fiction. The domestic and international data are in full agreement. Victoria has a relatively low participation rate because in has relatively high unutilised labour recourses.

Given this gross error of fact in the application of the MMRF Model the Auditor General has no option but to correct. This can only be done by re-running MMRF in long-run mode with slack labour resource availability around Australia. That is use in effect a basic input-output model. Much of the current content of the report will have to be rewritten to remove the errors of fact.

4. The Grand Prix being held in the month of March results in less claims on the hospitality sector of the Victorian economy than would be the case for December. The implication from the Auditor-General's report is that Christmas should be abolished.

The claim that the 2005 Formula One Grand Prix benefits should be discounted from the NIEIR estimates would carry some weight if it could be shown that the timing of the event resulted in peak seasonal activity in the Victorian economy. Table 2 indicates that this is not the case. Hospitality and services expenditure in March 2005 was 15 per cent below the December level. If the Victorian economy can accommodate Christmas, then it can easily accommodate the resource requirements of the AFOGP, especially in the current environment of flexible student labour supply.

If, on the other hand, the Auditor General maintains the view that the value of the AFOGP should be discounted because of resource constraints, then the priority should be the abolition of Christmas.

The table shows that a not seasonally adjusted total employment pattern for Victoria does not indicate that the total economy-wide labour resource requirement for March are greater than for any other month.

Table 2 Not seasonally adjusted hospitality and services (inc. restaurants) Victorian retail expenditure

	Victorian retail sales – hospitality and services – not seasonally adjusted ($ million)	Victorian retail sales – hospitality and services – not seasonally adjusted (% of December)	Victorian non-seasonally adjusted employment (% of December)	Victorian non-seasonally adjusted employment (% of December)
Dec-04	3043	100	2491	100
Jan-05	2585	85	2442	98
Feb-05	2369	78	2458	99
Mar-05	2593	85	2482	100
Apr-05	2666	88	2473	99
May-05	2634	87	2486	100
Jun-05	2595	85	2489	100
Jul-05	2753	90	2468	99
Aug-05	2699	89	2469	99
Sep-05	2731	90	2481	100
Oct-05	2909	96	2493	100
Nov-05	2906	95	2481	100

5. The other issues in the Draft Report of the realistic, structural superiority and transparency of the MMRF, compared to the IMP model, can be quickly dismissed by the public record and the facts of the Melbourne Tourism sector.

5.1 In Peter J. Brain's "*The Microeconomic Structure of the Australian Economy*", Longman Cheshire, 1986, a detailed account is given on an industry-by-industry, equation-by-equation basis of why CGE models are unrealistic and why NIEIR's IMP models are closer representation of reality.

The CGE model builders in Australia have never, to NIEIR's knowledge, rebutted the detailed criticisms in the book. This is because they cannot. Instead they have employed the only effective option. They have merely ignored its existence. They simply maintain the mantra of realism.

In this book there are 430 pages outlining why the MMRF/CGE models are unrealistic and why the IMP model is superior.

The core arguments in the book are as follows.

The NIEIR models are not crude input-output models, but exhibit sophisticated structural features that indicate that the basic input-output outcome may well under-estimate the impact.

The reasons for this are as follows.

The CGE models assume short run decreasing returns to scale and long constant returns to scale. Productivity is unchanged or declines when demand increases.

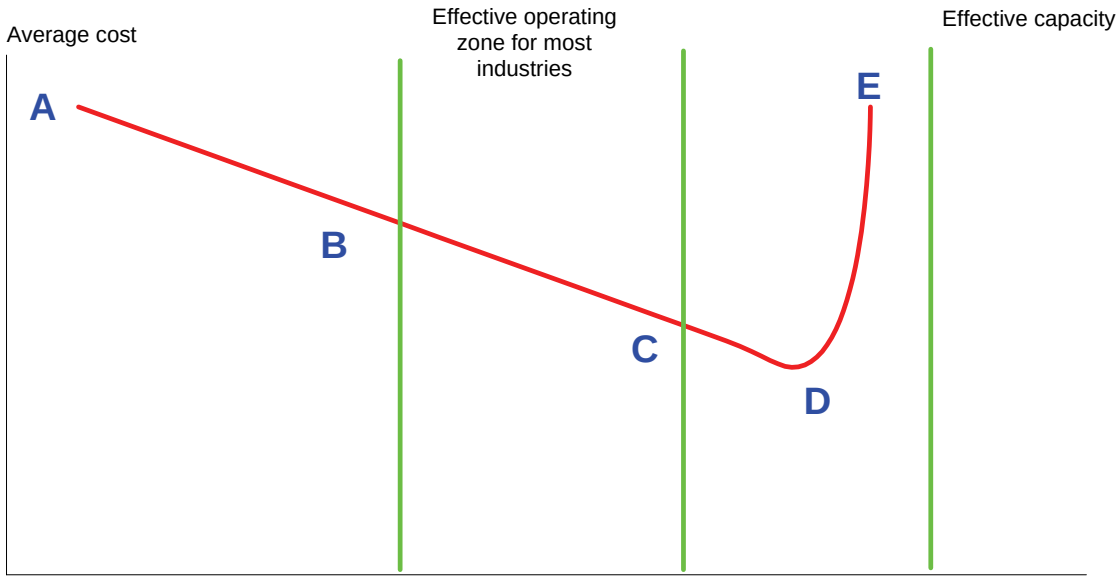
These assumptions do not align with the statistical evidence across countries and industries. CGE models violate a fundamental empirical law of economics, namely Verdoorn's Law that short and long run productivity growth is a function of output/demand growth. See John McCombie, M. Pugno and B. Soro "*Productivity Growth and Economic Performance: Essays on Verdoorn's Law*", Palgrave MacMillan, 2002.

Most of the industries in the NIEIR models, based on coefficients estimated from the data, exhibit increasing returns to scale in the long run and many increasing returns to scale in the short run. This means that as demand increases so does productivity, enabling a strong supply response. Most industries in the NIEIR models operate in the BC region of Figure 5.

Most industries on a long term basis stay within the BC region because a demand expansion increases short run profitability and provides the internal cash flow to fund expansion, which takes the industry to a lower short run supply schedule. A semi-permanent event like the AFOGP will induce the required long run investment to ensure that there are no long run crowding out effects. This is part of the input-output enhancement effect.

Price behaviour by domestic industry is generally targeted towards maintaining or restoring an optimal capacity utilisation rate.

Figure 5: Typical short run and average cost schematic for an industry in the NIEIR model



5.2 However, the core issue is does the structure of the tourism related industry in Victoria justify the MMRF or the NIEIR view?

In the IMP model's view of the world, short and long run productivity growth for the Victorian tourist industry is positively related to output growth. In the MMRF/CGE view of the world, productivity growth would at best be unrelated to output growth (the long run) or negatively related to output growth.

This can be tested for quarterly data for the 1-digit accommodation and restaurant ANZSIC industry in Victoria between June 1994 and June 2006. The estimated equation is:

$$[(VAT/TMH) / (VAT/TMH)_{t-4} - 1]$$

$$= \underset{(1.9)}{-0.0106} + \underset{(11.8)}{0.9442} \cdot [(VAT / VAT_{t-4}) - 1] \qquad R^2 = 0.77$$

Where:

VAT = Real value added for Victorian accommodation and restaurant industry.

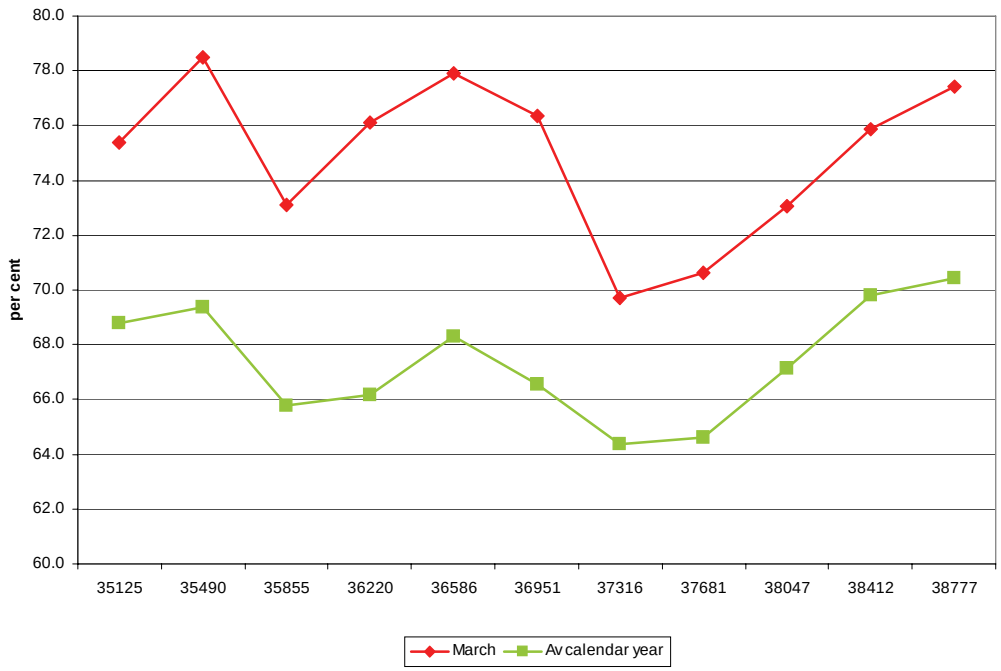
TMH = Total quarterly labour hours required by the Victorian accommodation and restaurant industry.

For the MMRF world to prevail, the (VAT/VAT_{t-4}) coefficient must be either not significantly different from 1 or significantly negative. It is strongly positive, which is the IMP model view.

And logic suggests, why would this not be the case? Once the hotel rooms are in place, the restaurant tables installed and the core staff employment, then any additional demand can be met with falling marginal costs as per Figure 6.

The conclusion is clear. In relation to the industry that benefits most from events, in the tourism industry, the cost responses are in line with the NIEIR view with no facts to support the MMRF assumption.

Figure 6: Melbourne SD room 0ccupancy rate March and calendar year



5.3 Like the seasonal aspect considered above in relation to labour, there is a remaining issue of whether there is enough capital, that is hotel rooms in particular, to support the AFOGP in March.

It is true that March is the peak occupancy rate for accommodation for Melbourne Statistical Divisions as identified by Figure 6. However, it is not greatly above the yearly average. However, even at peak load for March there is still an average 25 per cent unutilised room occupancy rate.

The investment model cycle for accommodation is very simple. Rooms adjust to the expected growth in demand (an average of past growth demand) adjusted to the extent current occupancy rates are more or less the optimal in the March month. This is taken to be 75 per cent. This model explains with good accuracy the increase in accommodation rooms in Melbourne SD from 29,900 in March 1996 to 37,100 in March 2006. The AFOGP has played a part in explaining this growth.

This mechanism shows the strategic value to Victorian tourism of a March AFOGP. By increasing peak load capacity it allows additional capacity to be available elsewhere in the year to support Victorian tourism. This is another factor which will enhance the AFOGP's impact relative to the straight input-output approach. It is captured but to a discounted extent in the IMP model results.

No doubt due to the "realistic" resource constraints of the MMRF model, the tourist industry will not "receive" adequate capital to get anywhere near the IMP model mechanism. The facts do not support this. Investment in hotel rooms is driven strongly by the criteria of maintaining an optimal utilisation rate given demand.

6. The precedents set by the Auditor-General's study would have to be rejected by governments because the implication is that government in Australia is a fraud with no capacity to impact on outcomes.

The first implication that flows from the draft report for other policy evaluation is that from a national perspective all tourism related enhancement programs should be axed along with tourism departments since they cannot significantly increase economic activity and employment and undermine the balance of payments by weakening the mining industry. Exactly what the skill overlap is between tourism and mining/construction is not clear but in the MMRF world there is assumed to be a strong overlap. The CRC for Sustainable Tourism should be also abolished because its objectives are worthless to the economy.

However the absurdity of the implications spread wider than Tourism. Federal and State Governments in Australia are continually applying programs across a wide range of activities to improve the employment opportunities of their citizens. These extend from investment attraction policies, industry development incentives, regional development programs, and government service infrastructure availability. All these programs are designed to increase the level of economic activity, increase the demand for labour, increase exports and, in many cases, strengthen the balance of payments.

The Grand Prix stimulates economic activity simply because it generates demand via increasing (service) exports from the State in the same way a port or manufacturing plant does. It does this by enhancing the competition of the State in the tourist market.

The precedent set by the Auditor-General's report is one where:

- national programs for industry development are ineffective at best and, at worst, counter productive in that the balance of payments and probably GDP would be enhanced if the Federal Government's abolished all other forms of industry development incentives, including most tax concessions in the Tax Act; and
- State Government is a fraud in Australia. Politicians who promise programs to reduce regional disparities in employment are frauds and liars because all that will happen at the State level is the relocation of employed from other States to take the net increase in jobs and at the regional level the relocation of already employed from other regions in the State to the targeted region. Absolutely nothing can be done in terms of demand enhancement policies to give an employment opportunity to people who are unemployed. Dandenong is doomed for ever to a 19 per cent unemployment rate presumable for an undefined long run or at least until we are all dead.

At the Federal level the precedent established is that the valued core functions of government are the defence and administration of the criminal justice system. At the State level the inference is that Australia would be better off if State Governments were abolished. There is nothing they can do and the nation would be better off if they were stopped from doing anything. That is, be abolished.

7. Other issues

The Draft Report proposes to discard three of the direct benefits identified by NIEIR. There are no grounds for this.

7.1 Induced tourism

The criticism of the induced tourism effect falls short. The NIEIR estimate is based on doing the best with the available information. However, the alternative of discarding it has no justification because it assumes that:

(ii) returning visitors have no impact on the decisions of others to come to Australia or Victoria;

(iii) publicity campaigns to highlight the attraction of destination via television in particular have no impact.

7.2 The enhanced resident expenditure effect

The statement "there is no evidence of the enhanced resident expenditure effect other than results of survey questions asked by NIEIR that asked visitors whether they had drawn on their savings to fund their Grand Prix expenditures" (Draft Report, page 148) is wrong. The 1996 AFOGP NIEIR report notes that NIEIR also rejected the results of the survey question. It based its estimate of the enhanced visitor expenditure effect not on the survey answers, but on microsimulation modelling of the ABS Household Expenditure Survey database. The estimate was based on comparing similar households with the difference being the degree of interest in (that is expenditure on) sporting activities.

7.3 The retained expenditure effect

The MMRF modellers got themselves in a muddle with the retained expenditure effect, which in effect invalidates their whole modelling methodology. In NIEIR's analysis the retained expenditure effect is built on a clear understanding of the event otherwise being held in Adelaide. The Draft Report notes "A more reasonable assumption is that if the event had not been held in Melbourne it would not have been held in Australia at all". NIEIR would accept this now as reasonable, except that if the base case is now to be an event overseas, then discarding the retained expenditure effect would, on balance, be likely to increase the Victorian impact because the national impact would be considerably greater.

However, the MMRF modellers, by discarding the retained visitor expenditure effect, invalidate their modelling methodology. The reasoning is straight forward.

Given that the event is held, the counter-factual which has to be modelled is the economy, as it would have been were the event not held. Failure to hold an event after building up clientele and expectations over a number of years (in an absence of substitute events appealing to a similar clientele) is expected to have the effects nominated in the NIEIR report, including Victorians going interstate or overseas to attend substitute events. There is also likely to be a reduction in the confidence of investors that demand will be maintained for tourism infrastructure in Melbourne.

By contrast with this simple on/off dichotomy, the MMRF modellers do not seem fully coherent in their comparison. Rather than comparing the economy as it has been with the event held (and which we observe) with an economy in which it is not held, the comparison seems to be between the economy as it is now, including the event series but excluding the event itself, with the economy including the event. It is not explained how it is possible to cancel the event without breaking the series. There seem to be technical difficulties to do with the structure of the MMRF model to adopting this approach, but given that events in series are incorporated into the base case of the model, and given that the model exists in both short-run and long-run versions, it should have been possible to provide alternative

estimates on the basis of short and long run negative shocks (i.e. the event is discontinued after becoming incorporated into the structure of the economy). This would require a specific base case.

In short, the event is already in the MMRF base case. By ignoring the retained visitor expenditure effect the MMRF are assuming the event never happened before in Australia, which is counter factual.

7.4 Transparency and expertise

In the context of the report, the statement that a high level of expertise is required in the MMRF model may well be true, but clearly from the model results, that expertise does not extend to understanding how the economy actually works.

Another claim of the Draft Report is that the MMRF results are "transparent". Clearly the Auditor-General Department by endorsing the results had no understanding of what was assumed or implied. Otherwise, they would not have endorsed the results as fact, rather than the fiction it represents. To the Auditor-General Department the model is obviously extremely non-transparent.

7.5 Use of models overseas for tourist event evaluation

A search of the literature reveals that in North America there is strong interest in event evaluation from the perspective of the benefits relative to Government support. Most are basic input-output models which in NIEIR's view is fine given that they represent a good approximation to reality.

For example, the TREIM model has just completed development for event evaluation for the Ministry of Tourism in Ontario, The Centre for Spatial Economics: *The Ontario Tourism Regional Economic Impact Model (REIM)*, Toronto 2006. Although very detailed in its database it represents a static basic input-output/inter-regional model. The others are much the same. Examples include the Regional Input-Output Model (REIM) which covers 11 American States, developed by the University of Illinois, Regional Economic Applications Laboratory. The T-MAP-I economic input model, University of Minnesota Tourism Centre's "The economic Impact of Expenditures by Travellers on Minnesota, June 2005-May 2006. The United States Government's economic impact modes are basic input-output models, e.g. The Bureau of Economic Analysis' (BEA) RIMS II User Handbook.

Of particular interest here is the REMI Model which has been used to evaluate events and the tourism industry across North America. This is a "realistic" input-output based model of the type the Auditor General claims should be used, as its description in Appendix C shows. The most detailed recent report of the use of the Model is in The Vermont Department of Tourism and Marketing: *The Travel and Tourism Industry in Vermont*, June 2005 from which Appendix C is taken.

The main point of the description is that, as long as "long-run" is put in front of profit maximisation then the description in Appendix C would be in perfect agreement with NIEIR's description of the IMP model. Alternatively if dynamic was dropped from input-output then MMRF would also claim ownership of the description. Well what is it since transparency is not obvious from the description? To do this one has to look at the results. The results indicate clearly an IMP type model in terms of a limited duration event outcomes. A total tourist expenditure of $1.46 billion produces an output increase of $2.1 billion in the impact year with total employment of 36,470 in Vermont. Of these, just under 7,000 come from an increase in the workforce, of which approximately 3,500 appear to come from migration into the State (page 31). Of interest is when the Vermont results are adjusted to the AFOGP, the results are an employment increase of 2,650 and an output increase of $155 million. When the results are further adjusted for the small size of the Vermont economy, that is a population of 600,000, to the size of the Victorian economy required for multiplier adjustment, the results would be likely to be significantly greater than the IMP model estimates.

The CGE models are of course used for event evaluation. Mostly this is because the users, like the Auditor General, have no real understanding of the models to their capability. If they understood they would not use them.

Finally the Draft Report reads, in part, like a propaganda sheet for a group of consultants. There is little appeal to facts or logic. The standard of the argument is along the lines of "believe the world is flat, I have mates who think the world is flat, therefore the world is flat". In this context NIEIR would welcome the retention of the recommendation for the use of CGE models for event evaluation. This is just the evidence NIEIR needs to demonstrate malice so a group of consultants could win market share.

8. To overcome the flaws in the Draft Report the Auditor-General Department will be required to undertake a number of tasks to eradicate errors of fact. Failure to do so would indicate malice on the part of the authors.

In order to ensure that this is not the case in the final report, NIEIR requires that the following actions be undertaken by the Auditor-General.

1. A point by point rebutting of objections made in Peter Brain's "*The Structure of the Australian Economy*" against CGE models vis a vis the IMP Model. An agreed set of independent referees to asses the adequacy of the replies.
2. Re-running the CGE model used to evaluate the Grand Prix under the following assumptions:
   (i) unemployed resources in Victoria and the rest of Australia;
   (ii) decreasing long-run and at least short run constant returns to scale for all industries; and
   (iii) short run prices set in line with their average costs,
   (iv) an export supply elasticity set at 0.5.

   with endorsement of agreed independent referees that these runs have been carried out appropriately.
3. A written response from each of the principals involved in the preparation of the Draft Report (including Allen Consulting) explaining why they put their name to a study that assumes that there was no capacity of the Victorian economy to respond to demand stimulus in 2005 by any reduction in the unemployment rate, any increased hours worked by those in employment or by any increase in the labour supply from those outside the workforce. And why they put there name to a study which directly shows that at the very least all tourism enhancement programs will be ineffective and costly in terms of the balance of payments at the national level. Also why they put their name and reputation behind a study which assumes that Dandenong residents can never take advantage of demand generated employment opportunities despite their un-employment rate being 19 percent.
4. Conduct a survey of at least 40 working professional economists in Government and Industry to ask them to answer the following question:

If there was a $100 million increase in final demand in the Victorian economy in 2005, which of the following is most likely to happen after deduction of import content.

1. Victorian residents would have been incapable of supplying one more hour of labour so that all employment to support the increase would have to come from outside the State.
2. Approximately 5 to 10 per cent of the employment increase would have come from outside the State. However, the increasing hours would have come from a mixture of:

(i) increased overtime by those in full time employment;

(ii) part timers working longer hours;

(iii) some reduction in the unemployment pool;

(iv) those not in the workforce, such as students, being attracted back into the workforce by the additional employment opportunities.

Appendix A: NIEIR Unemployment rate

Unemployment

This is a National Economics' measure derived from Centrelink data. It includes all people receiving Newstart allowance, Mature Age Allowance, excess growth in DSP (that is, at a level greater than population growth), youth allowance as a non-student and an estimate of students on youth allowance who are, for example, unemployed and undertaking compulsory training. This latter measure is based on demographic trends and microsimulation.

Headline U/E

This is the unemployment rate produced by the *Department of Employment, Education and Training* (DEET). The information is contained in the *Small Area Labour Markets* publication. It contains estimates of employment, labour force participation, unemployment and the unemployment rate by Statistical Local Areas (SLAs). NIEIR does additional adjustments to the data to smooth the series. Hence, it is now designated the headline unemployment rate to denote that it is not exactly equal to the DEET series.

NIEIR Structural U/E

This is a measure of the level of long-term unemployed as a percentage of the population aged 18 to 65 years old. It includes all those classified as long-term unemployed, those receiving disability support pensions, 50 per cent of people from a non-English speaking background receiving Newstart allowance, 50 per cent of people receiving single parents benefits and all people receiving the mature age allowance. This measure excludes people on Newstart allowance short-term and anyone receiving youth allowance. It therefore assumes that none of the youth are structurally unemployed.

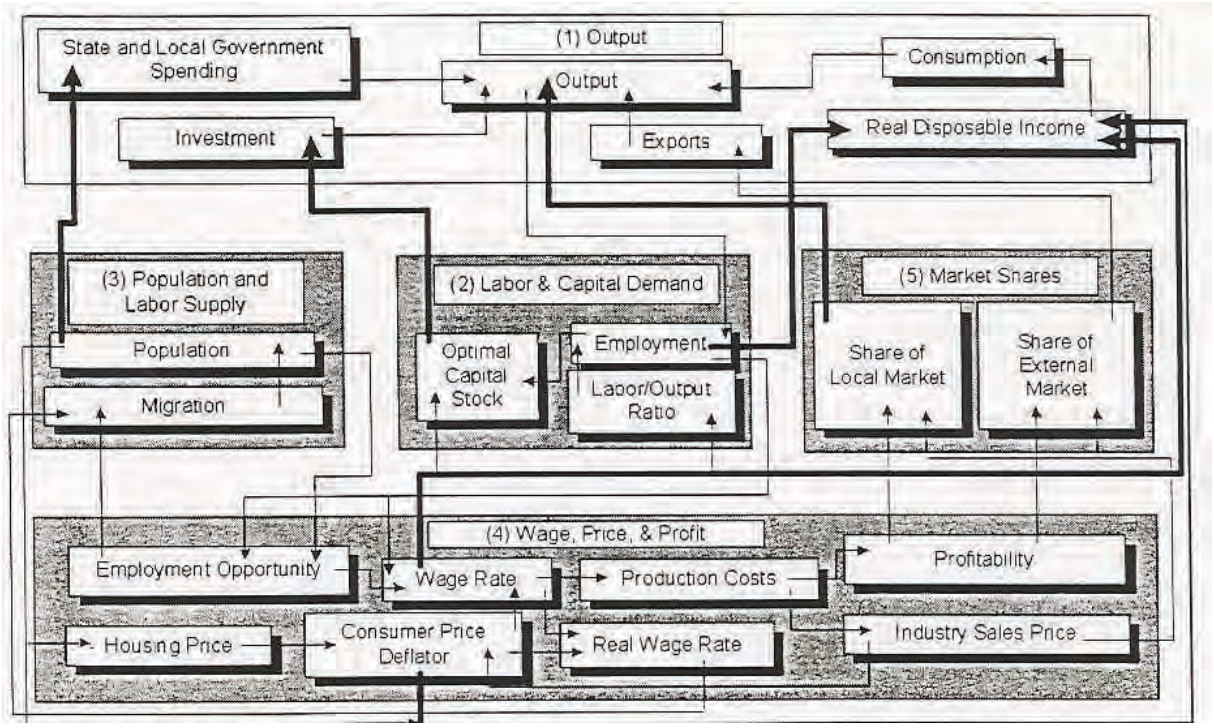
Appendix B: Taken from Vermont Tourism Report

The final component of this study involves using “best practices’ approaches to complete an estimate of the economic impact and the fiscal importance of the travel industry to Vermont. The economic impact assessment portion of the study has been undertaken using the REMI dynamic input-output analysis. The fiscal impact portion of this study – which included the construction of a state fiscal impact model – included a comprehensive evaluation of the state fiscal benefits (e.g. revenues, fees, etc.) and costs (e.g. state education, appropriate parts of the general budget, transportation, etc.) related to the direct and indirect impacts of the state’s travel industry during calendar year 2003.

This study employed a dynamic input-output model known as the REMI Policy Insight model to help measure the indirect impact of visitor spending in the travel industry during calendar year 2003. The REMI Policy Insight model is a product of Regional Economic Modelling, Inc. of Amherst, Massachusetts (For a full description of the REMI Policy Insight Model, see Appendix VI of this report). The REMI policy model is a highly regarded and widely recognized tool that has been successfully used to undertake the exact type of analysis of the travel and tourism’s economic significance that was one of the primary objectives of this study. Input-output modelling, and the REMI model in particular, has an over 20 year record of development and history of use to assess the economic impact of travel activities as an industry in many other states as well as on the national level.

A REMI model for the state of Vermont was used for this study. Inputs to the REMI model included the development of estimates of direct visitor spending activity by specific sector where travel expenditures were made during calendar year 2003. These visitor spending estimates were developed according to the methods described previously and in the Appendix I through Appendix V of this report.

REMI Model



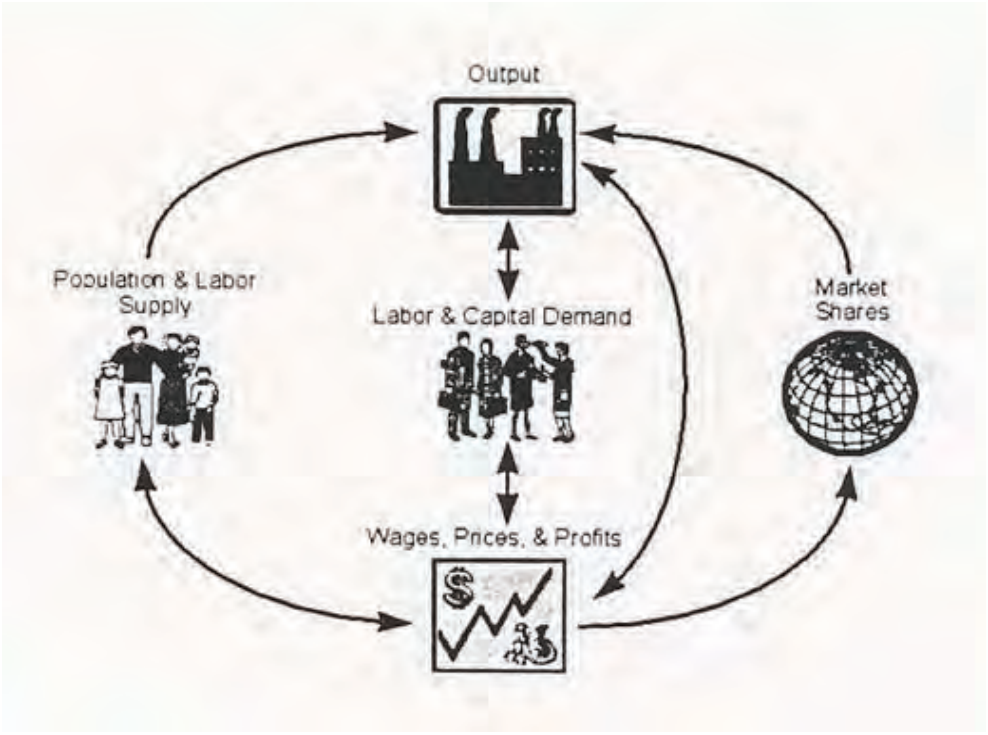
The REMI model is a structural model, meaning that it clearly includes cause-and-effect relationships. The model shares two key underlying assumptions with mainstream economic theory: *households maximize utility* and *producers maximize profits*.

In the model, businesses produce goods to sell to other firms, consumers, investors, governments and purchasers outside the region. The output is produced using labour, capital, fuel and intermediate inputs. The demand for labour, capital and fuel per unit output depends on their relative costs, since an increase in the price of any one of these inputs leads to substitution away from that input to other inputs. The supply of labour in the model depends on the number of people in the population and the proportion of those people who participate in the labour force. Economic migration affects the population size. People will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labour in the model determine the wage rates. These wage rates, along with other prices and productivity, determine the cost of doing business for every industry in the model. An increase in the cost of doing business causes either an increase in price or a cut in profits, depending on the market supplied by local firms. This market share combined with the demand described above determines the amount of local output. Of course, the model has many other feedbacks. For example, changes in wages and employment impact income and consumption, while economic expansion changes investment and population growth impacts government spending.

Model Overview

The following figure is a pictorial representation of the model. The Output block shows a factory that sells to all the sectors of final demand as well as to other industries. The Labour and Capital Demand block shows how labour and capital requirements depend on both output and their relative costs. Population and Labour Supply are shown as contributing to demand and to wage determination in the product and labour market. The feedback from this market shows that economic migrants respond to labour market conditions. Demand and supply interact in the Wage, Price and Profit block. Once prices and profits are established, the determine market shares, which along with components of demand, determine output.



The REMI model brings together all of the above elements to determine the value of each of the variables in the model for each year in the baseline forecasts. The model includes all the inter-industry relationships that are in an input-output model in the Output block, but goes well beyond the input-output model by including the relationships in all of the other blocks shown in Figure A.1.

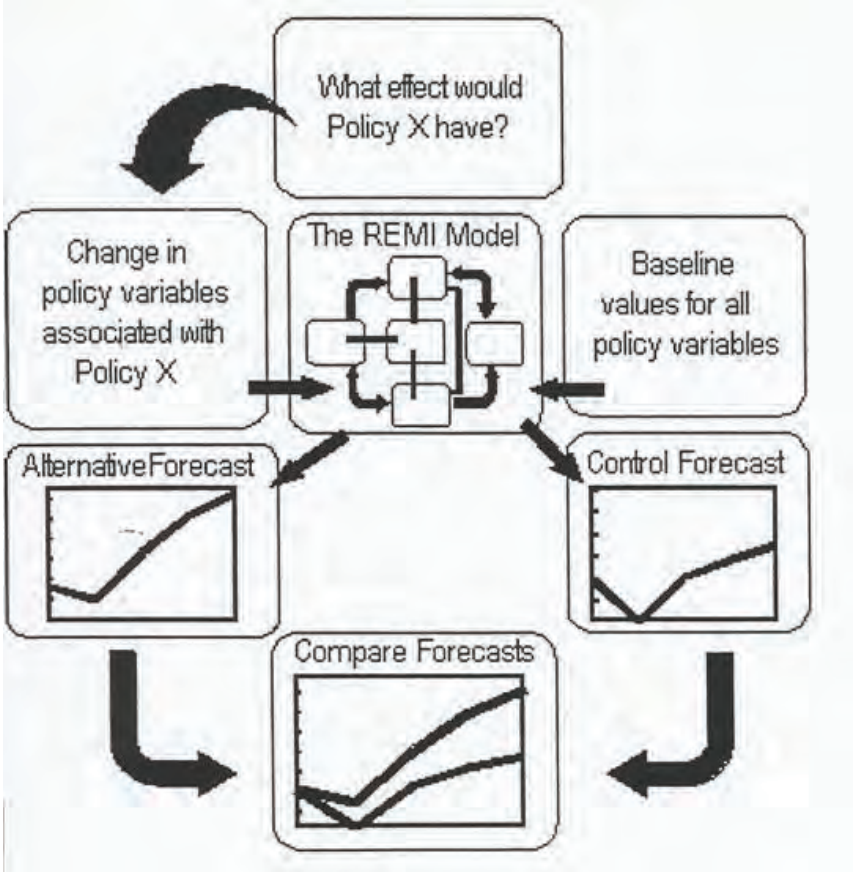
In order to broaden the model in this way, it was necessary to estimate key relationships. This was accomplished by using extensive data sets covering all areas of the country. These large data sets and two decades of research effort have enabled REMI to simultaneously maintain a theoretically sound model structure and build a model based on all the relevant data available.

The model has strong dynamic properties, which means that it forecasts not only what will happen, but when it will happen. This results in long term predictions that have general equilibrium properties. This means that the long-term properties of general equilibrium models are preserved without sacrificing the accuracy of event timing predictions and without simply taking elasticity estimates from secondary sources.

Understanding the model

In order to understand how the model works, it is critical to know how the key variables in the model interact with one another and how policy changes are introduced into the model. To introduce a policy change, begin by formulating a policy question. Next, select a baseline forecast that uses the baseline assumptions about the external policy variables and then generate an alternative forecast using an external variable set that includes changes in the external values, which are effected by the policy issue.

The following figure shows how this process would work for a policy change called Policy X.



In order to understand the major elements in the model and their interactions, subsequent sections examine the various blocks and their important variable types, along with their relationships to each other and to other variables in the other blocks. The only variables discussed are those that interact with each other in the model. Variables determined outside of the model include:

- variables determined in the U.S. and world economy (e.g., demand for computers);
- variables that may change and affect the local area, but over which the local area has no control (e.g., an increase in international migration); and
- variables that are under control of local policy (e.g., local tax rates).

For simplicity, the last two categories are called policy variables. Changes in these variables are automatically entered directly into the appropriate place in the model structure. Therefore, the diagram showing the model structure also serves as a guide to the organisation of the policy variables (see Figure 3).

Output Block

The Output Block variables are:

- State and Local Government spending;
- investment;
- exports;
- consumption; and
- real disposable income

These variables interact with each other to determine output and also depend on variable values determined in other blocks as follows.

Appendix C: Data sources

The data used in this report are either directly used or derived from ABS sources.

Australian Bureau of Statistics Publications:

6291.0.55.003 – Labour Force, Australia, Detailed, Quarterly, Nov 2006

6220.0 – Persons Not in the Labour Force, September 2005

6265.0 – Underemployed Workers, September 2006

5206.0 – Australian National Accounts: National Income, Expenditure and Product, Dec 2006 (State details)

5220.0 – Australian National Accounts: State Accounts, 2005-06

3101.0 – Australian Demographic Statistics, Jun 2006

8501.0 – Retail Trade, Australia, Jan 2007

The only series which not transparent is the quarterly accommodation, etc. output series. This series is derived by using quarterly indicators to produce a quarterly pattern for the State Accounts annual totals and then benchmarking the estimates to the national control totals for the industry given in 5206.0.

The foreign employment data is taken from OECD "*Employment Outlook*", Paris 2005.

Auditor-General's reports

2006-07

Report title	Date issued
Review of major public cemeteries (2006:5)	July 2006
Vocational education and training: Meeting the skill needs of the manufacturing industry (2006:6)	July 2006
Making travel safer: Victoria's speed enforcement program (2006:7)	July 2006
Results of special audits and other investigations (2006:8)	August 2006
Condition of public sector residential aged care facilities (2006:9)	August 2006
Government advertising (2006:10)	September 2006
Auditor-General's Report on the Annual Financial Report of the State of Victoria, 2005-06 (2006:11)	September 2006
Results of financial statement audits for agencies with 30 June 2006 balance dates (2007:1)	February 2007
Giving Victorian children the best start in life (2007:2)	May 2007

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  Phone: +61 3 8601 7000
  Fax: +61 3 8601 7010
  Email: <comments@audit.vic.gov.au>
  Website: <www.audit.vic.gov.au>