2005 Australian Formula One Grand Prix

Cost-Benefit Analysis for the State of Victoria

Prepared for

Auditor-General Victoria

Applied Economics

September 2006

Contents

Summary

This report provides a cost-benefit analysis of the holding of the Australian Formula One Grand Prix in Melbourne in 2005. Before presenting the results, some preliminary observations should be made.

First this study provides estimates of the costs and benefits of the Grand Prix event to Victoria. There is a brief discussion in section 6.3 of how this might differ from a cost-benefit analysis for Australia.

Second, the report presents an analysis of the costs and benefits of the holding of the event in one year (2005). As discussed in section 6.1, this evaluation differs in a few minor from an evaluation of the decision to start the event in Melbourne in 1996 or of a decision to commit to further Grand Prix events from 2011.

Third, the analysis is an evaluation of the whole event, including various entertainments and race practices and culminating in the Formula One Grand Prix itself, ran over four days from 3 to 6 March.

Fourth, the analysis is based on available data. We reviewed the reliability of these data but collection of new data was outside the scope of the exercise.

Fifth, although some estimates are subject to a significant variance around the estimated mean, costs and benefits are estimated for all significant variables. Providing the assumptions are transparent, a comprehensive and inclusive study shows the key issues better than a study that excludes significant variables.

The results estimated above for the 2005 Grand Prix are summarized in the summary table below (also Table 6 in the report).

The estimated costs of the event totaled $71.7 million. The expenses incurred by the Australian Grand Prix Corporation ($70.1 million) to construct and run the event constitute nearly 98 per cent of the costs.

The study also provides indicative estimates of the costs of loss of park use and amenity, transport congestion and noise based on available data. These amount to an estimated $1.4 million and are significant locally, but are only 2.0 per cent of total estimated cost.

The estimated benefits totaled $67.9 million. Payments to the Australian Grand Prix Corporation represented 77.2 per cent of the total.

Estimated benefits (net surpluses) to Victorian firms and labour represent 14.3 per cent of the benefits.

Estimated consumer surpluses (for Victorians) make up the rest of the benefits. These surpluses include the estimated surpluses of Victorians attending the event and surpluses of Victorians gaining pleasure from watching the event in the streets or at home.

Accordingly the estimated net social benefit is -$3.8 million and the benefit-cost ratio is 0.95. These results imply that the estimated costs exceed the benefits to Victoria by 5 per cent.

Because the major costs and benefits are known and accurate, the overall result is quite robust. The major possible variances arise with the smaller estimates of costs and benefits and changes to these values would not change the results significantly.

The main uncertain benefits are profits to Victorian firms and surpluses to Victorian labour. The report attributes $9.4 million benefits to these two groups compared with estimated generated expenditure in Victorian of $55 million. Bearing in mind the import content of goods, the other costs of providing extra goods and Commonwealth taxes, in the view of the report, an upper limit of the business benefits to Victoria would be 25 per cent of generated expenditure which would be $13.75 million. If this were achieved, the costs and benefits of the Grand Prix would be approximately equal.

Finally, the report does not estimate any non-use value of the event. This is a value that Victorians might place on having the event in Victoria over and above any benefits that are actually experienced including such benefits as watching the event on home television (for which a value is imputed). A non-use value may arise from a sense of civic pride or an enjoyment of the festivity in the environment created by the event.

Summary Table Costs and Benefits for Victoria

Costs and Benefits	$m
Costs	
GP construction and operation costs [a]	70.1
Other GP-related government costs	0.2
Loss of park uses and amenity	0.5
Transport congestion	0.5
Noise costs	0.4
Total quantified costs	71.7
Benefits	
Visitor payments to AGPC	41.5
Sponsor payments to AGPC	10.9
Victorian visitor consumer surpluses	3.8
Net profit to Victorian businesses during GP	8.3
Net profit to Victorian businesses after GP[b]	0.3
Generated labour surpluses	1.1
Other consumer benefits of Victorians	2.0
Total quantified benefits	67.9
Net Benefit	-3.8

1 Introduction

The Australian Formula One Grand Prix (hereafter the Grand Prix) comprises four days of events from Thursday to Sunday in Albert Park, Melbourne, as well as related civic events mainly in the Melbourne 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 occur in the Melbourne CBD. In 2005 there was a parade of F1 cars in the city. There was also a live site in Fed Square in the centre of the CBD where a few thousand spectators followed each of the main events in Albert Park.

This report provides a cost-benefit analysis of the program of events that together made up the Grand Prix week in 2005. The year 2005 was chosen by the Auditor-General for two reasons. First, the National Institute of Economic and Social Research (2005) prepared an economic impact evaluation of the 2005 event, which provides estimates of attendance and expenditure at the Grand Prix that are relevant to the cost-benefit analysis. Second, there were no extraordinary events that could distort the outcomes. In 2006, Melbourne hosted the Commonwealth Games shortly before the Grand Prix.

A number of other important preliminary points should be made about this cost-benefit analysis. First, 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 by consumers and producers of the event(s) and by other (third-party) members of the community who may be neither consumers or producers of these events. Such a study is quite different from an economic impact study which estimates the change in gross economic output. An economic impact study does not include benefits to consumers or third party effects and estimates changes in gross output rather than the net profit of producers (after accounting for relevant costs).

Second, this cost-benefit study estimates the welfare effects on households in the state of Victoria. This includes costs and benefits that are borne initially by the Victorian government or business, but are borne ultimately by the households in the community. The study does not attempt to estimate the welfare effects for Australia, though brief comments on this are made in the final chapter.

Third, consistent with our brief, this is a cost-benefit analysis of the holding of the Grand Prix in 2005. The starting point is that the event had been held for nine years in Melbourne and that a grand prix track exists in Albert Park. The cost-benefit analysis examines the costs and benefits of holding the Grand Prix in 2005 rather than not holding it.[1]

[1] The study does not include avoiding the cost of breaking the contract with the holders of the Formula One rights as a benefit of holding the 2005 Grand Prix as this is not considered relevant to this exercise.

A cost-benefit analysis of the decision to start running the Grand Prix in Albert Park in 1996 or to continue running it from 2011 under a new contract would involve slightly different costs and benefits. These differences are also discussed in the final chapter.

Fourth, this analysis relies mainly on data that have been collected previously by other agencies or individuals. We have checked these data as far as we can and used them only when they appear reliable. We have also collected some new data. However, major new data collection has been beyond the scope of this exercise. This means that some relevant data are not available.

In this cost-benefit analysis, values of costs and benefits are estimated where possible. Some of these values are uncertain and/or subject to a significant variance around the estimated mean. However, the figures and assumptions are transparent. Also a comprehensive and inclusive study has advantages compared with a partial study. Excluding effects runs the risk that, on the one hand, these effects may be ignored or, on the other hand, the effects may be assumed to have exaggerated values.

Finally it may be noted that a prime purpose of this work is to illustrate an important method for evaluating major events. Although the analysis is an ex-post (after the event) evaluation, an ex-ante (before the event) evaluation would follow similar lines.

Layout of the report

Chapter 2 provides an overview of the method of cost-benefit analysis and how it is applied to the 2005 Australian Grand Prix.

Chapters 3 and 4 report the estimated major costs and benefits of the 2005 Grand Prix respectively.

Chapter 5 provides a summary of the overall results. This includes sensitivity and distributional analyses.

Chapter 6 discusses some related issues of interpretation and policy. These include how a cost-benefit analysis of the Grand Prix in the long run might differ from the present short-run analysis, why the cost-benefit welfare results differ from estimates of the change in gross state product, and how a cost-benefit analysis for Australia could differ from a cost-benefit analysis for Victoria.

2 The Cost-Benefit Method and the Grand Prix

2.1 Welfare, Efficiency and Distributional Effects

As we have noted, a cost-benefit analysis attempts to estimate the welfare effects of a policy or project on a community, generally comprising consumers, producers and third parties. Consumers are usually willing participants and can be expected to be beneficiaries. Producers may make profits or losses (it is these surpluses, positive or negative, that matter). On the other hand, third party effects are often negative because they typically reflect costs imposed on unwilling households.

The net social benefit is the sum of the estimated welfare effects. If the net social benefit is positive, the total benefit exceeds the total cost and the policy or project is said to be efficient.

However, policy makers may also be concerned with the distributional effects. In practice public decisions depend not only on the net social benefit, but also on how the components of this benefit are distributed.

In this chapter, the major costs and benefits of the Grand Prix are estimated and aggregated. We also briefly discuss how the results may be interpreted, in particular in comparison with an economic impact study.

2.2 Estimating Costs of the 2005 Grand Prix

There are three main sets of costs of the Grand Prix for Victorians are:

- Construction and operation costs incurred by the Australian Grand Prix Corporation (AGPC). AGPC is a publicly-owned corporation responsible for managing the Formula One motor vehicle and 500 CC motor cycle races.

- Other Grand Prix related costs incurred by other Victorian Government agencies.

- Costs incurred by the Victorian community, including loss of park uses and amenity, transport congestion, and noise costs.

Construction and operating costs incurred by the Australian Grand Prix Corporation

The Australian Grand Prix Corporation (AGPC) incurs most of the costs of constructing and operating the Grand Prix circuit and marketing and administering the Grand Prix. As we will see in Chapter 3, the AGPC also pays most government agencies for their services and compensates Albert Park tenants partially for their loss of rent and amenity.

These publicly incurred expenditures have a real opportunity cost. The money could be spent on schools or hospitals in Victoria or indeed on other kinds of roads that would serve the general Victorian community. The cost of running the Grand Prix is the value of other goods and services foregone by Victorians.

In general if $x million is spent on the Australian Grand Prix, this is the value of goods and services foregone. The cost of employing labor for the event is the value of what that labour could have produced in its best alternative use. Thus the full cost of producing the event is a cost in the costs-benefit analysis.

Of course, in so far as the AGPC receives payments for managing the Grand Prix, the net cost to Government is less than the gross cost. This is recognized in the benefit section below. However, the underlying opportunity cost of running the Grand Prix is unchanged.

It may be contended that expenditure on the Grand Prix creates local employment or gives profits to local producers. But the same would be generally true if a similar amount were spent on Victorian schools, hospitals or roads.

Expenditure on the Grand Prix would create more profit for local employers or more local employment only if (a) Grand Prix expenditure has a higher local spending content than other public expenditure and (b) this additional local expenditure generates higher local incomes rather than displacing output and indirectly creating more imports.

While a detailed breakdown of the components of AGPC expenditure is not available, it seems unlikely that it is has an especially high Victorian component especially as there is a significant license fee paid to the foreign holders of the FI license.

Nor is there any reason to suppose that the AGPC generates more local employment than would an equivalent amount spent in other public works.

Accordingly, the cost-benefit analysis treats the relevant AGPC expenditures as a cost to the Victorian community.

Other Grand Prix related costs incurred by other Government agencies

Similar principles apply to costs incurred by other government agencies. In fact, many agencies are reimbursed by AGPC. Their expenses are additional to AGPC expenditures only in so far as they are not reimbursed.

Some government agencies may incur costs that are not readily identifiable as Grand Prix expenses in their accounts. Again, where they are not included in AGPC expenses, they need to be accounted for as they have an opportunity cost in value of services foregone. The Victorian Auditor-General contacted all the relevant agencies to determine whether there were any such costs.

Community costs

As noted, there are three main categories of community costs: losses of park use and amenity, transport congestion and possibly accident costs, and noise costs.

In each case, there are two main steps in the valuation process. The first step is to estimate the amount of loss (of amenity, congestion, accidents, and noise). The second is to estimate the cost of that amount of loss.

In the case of park use and amenity, estimates are required of the uses that are prevented or disturbed and of the number of people whose use is prevented or disturbed over about a 12 week period, inclusive of preparing for the Grand Prix, the Grand Prix week, and the clean up period. Values must then be estimated for these losses.

In the case of transport congestion, estimates are needed of the effect of the local road closures on traffic volumes, speeds and congestion and the cost of the extra travel time.

Referring to traffic accidents, there is some concern that the geometry of the Grand Prix track increases accidents. However, this is a long-term issue which would not be affected by the holding of the 2005 Grand Prix. This issue is picked up in section 6.1.

In the case of noise, estimates are needed of the amount of extra noise imposed by the construction and operation of the Grand Prix on local residents and the cost of this noise.

As will be seen in Section 3.3, some relevant data are not readily available. However, it is possible to estimate reasonably plausible costs for each major cost category.

It may be noted that these community costs do not include trading losses by local businesses adversely affected by the Grand Prix. The Grand Prix may cause a redistribution of spending among traders but it is unlikely to reduce spending in Victoria. On the contrary, the Grand Prix is likely to increase local spending. Therefore losses by some traders will be offset by gains to others and there may be net trading gains.

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

2.3 Estimating Benefits of the 2005 Grand Prix

There are four main sets of benefits to Victorians from the Grand Prix:

- Visitor and sponsor payments to the AGPC.
- Victorian Grand Prix consumer surpluses.
- Net profits gained by Victorian businesses and labour.
- Other benefits, for example benefits of related CBD entertainments.

Visitor and sponsor payments to the AGPC

The visitor and sponsor revenue paid to the AGPC (less any GST payments) is a benefit to the Victorian taxpayer that partly offsets the costs incurred in putting on the Grand Prix.

Victorian Grand Prix consumer surpluses

In cost-benefit evaluations, the gross consumer benefit is typically valued at the maximum amount that consumers are willing to pay for them (see Department of Finance, 2006). This willingness to pay amount represents the goods and services that consumers are willing to forego for this experience.

In competitive markets, where there are many close substitute goods provided by many alternative suppliers, the price charged for any good is close to the maximum that the consumer will pay for it. In such markets, the payments to a firm represent the value of its goods or services to consumers.

Where there are one-off events, there are still indirect substitutes which limit the amount that people will pay for the experience. Moreover, the firm supplying the event may try to charge the highest possible price to maximize its profit. This means that the price paid reflects the benefit of the good. Nevertheless, ticket prices may not reflect the maximum that many consumers will pay for the good. The difference between what consumers are willing to pay for something and the price they actually pay is known as consumer surplus.

This principle is demonstrated in Figure 1. This shows a linear demand 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 (*CS*). This surplus can be estimated with information or assumptions about shape of the demand curve. Possible assumptions and estimates of Victorian consumer surplus are discussed in section 4.2.

It should be noted that the surplus shown in Figure 1 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 and consumer surpluses available on other goods.

Consumer surplus is commonly estimated and included in cost-benefit studies where services are provided free, such as road transport or health services (see for example Boardman et al., 2006). On the Thursday of the 2005 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.

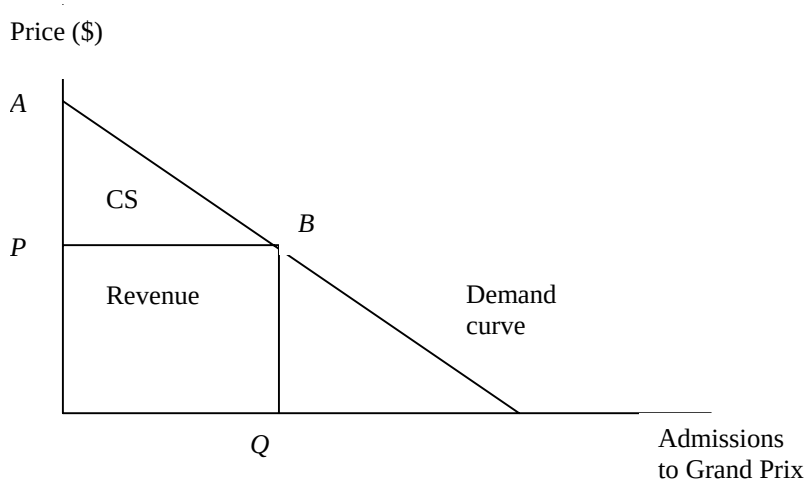

Figure 1 Consumer surplus

Net profits gained by Victorian businesses and labour

Victorian firms may increase their profits as a result of increased expenditure on Victorian produced goods and services. Nearly all of this increase occurs during or around the time of the Grand Prix due to increased international or interstate visitation.

In so far as marketing exposure from the Grand Prix attracts more visitors to Melbourne in the longer term, there may also be a longer term (induced tourism) effect.

The benefits to Victorian business depend on (i) an increase in expenditure on Victorian produced goods and services and (ii) the amount of operating profit from this expenditure after tax.

The drivers of extra expenditure in the state are increased international and interstate visitors. However, not all this local expenditure represents purchases of Victorian goods and services. Many Victorian goods have (international or interstate) import content. When visitors buy Chinese-made products in local shops, there is a limited retail mark-up benefit to Victorian businesses.[2]

In addition, Victorian firms benefit only in so far as they make a profit after tax. In so far as local firms service new demand instead of existing demand, or service new demand by incurring higher payroll costs, there is no increase in profit. Turnover is not a measure of profit or of benefit. Also Commonwealth taxes must be accounted for.

[2] Some visitors might purchase Victorian goods outside the state even if they did not visit the state for the Grand Prix. This amount is likely to be small and is ignored in this study.

Various other points need to be made.

First, in so far as firms employ more workers and pay wages above the minimum amount that the workers require to induce them to work, the workers obtain some labour surplus. Here the surplus accrues to employees rather than to owners of firms. But again the benefit reflects the (generally small) surplus accruing after due compensation for working, not gross payments.

Second, non-Victorians own all or part of some firms (especially large ones) operating in Victoria. For example, foreign interests own 42 per cent of Qantas. In principle, income accruing to non-Victorians should be debited from a Victorian cost-benefit analysis. On the other hand, Victorians may benefit from ownership of increased business in other parts of Australia that gain from the Grand Prix. This report does not attempt to capture these details.

Third, this report assumes that the Grand Prix will not affect the amount of time that Victorians spend in the state, though it may affect when they leave the state. Some Victorians may stay in the state to enjoy the Grand Prix, while others take a holiday to escape it.

Fourth, it may be observed that Victorian household expenditure on non-Grand Prix Victorian goods may fall as Victorian households divert expenditure to the Grand Prix. However, this should not affect total expenditure in Victoria. The reasoning is as follows.

If the public sector spends $\$X$ million on the GP funded from consolidated revenue, it could also spend the same amount on roads, schools or whatever. Aggregate spending in the state and aggregate state output would be similar except in so far as one set of spending could have more import content than the other.

Now if the state receives $\$Y$ million from local households and visitors for the GP, it can spend this amount of $\$Y$ million on other goods and services. This payment is a funding mechanism (or transfer payment); it is not resource expenditure. In this case the state would spend again spend $\$X$ million [$\$(X - Y + Y)$] on various works. There would be no change in aggregate expenditure in Victoria.

Thus, any change in aggregate expenditure in the short run is driven by non-GP expenditures by international and interstate visitors. However, the welfare effects for Victoria firms and households depend on local operating surpluses or employee surpluses.

Section 4.3 describes the data and assumptions to estimate the net profits of Victorian businesses and surpluses accruing to Victorian labour.

Other benefits to Victorians

There are two main forms of other benefits to Victorians. One is benefits to Victorians who participate in related Grand Prix events. The main such events occur in the CBD, including the parade of F1 cars and the live site in Fed Square attended by several thousand people.

Of course, Fed Square hosts live site functions for major events outside Victoria, such as World Soccer. However, the Australian Formula One Grand Prix attracts such crowds because it is a Melbourne event. It is understood that Grand Prix events in other countries do not attract such crowds. The Fed Square participants for the Australian Grand Prix are gaining pleasure (benefits) because it is held in Melbourne.

Secondly, there is said to be popular support for holding such a major event in Melbourne and for the festivity that the event engenders even among those who do not visit the Grand Prix or participate in related events. In principle, the amount that people are willing to contribute to a public project even when they do not consume its services reflects a social valuation of an event that is part of a cost-benefit calculus. This is known as non-use values. This is an established principle in valuing environmental goods such as the preservation of wildlife and heritage (see Boardman et al., 2006).

In the case of the 2005 Grand Prix, we are not aware of any surveys or other attempts to estimating non-use values. Nor does this report attempt to estimate non-use values.

2.4 Aggregation of Costs and Benefits

All benefits and costs described above are valued in this study in the same unit of value, namely 2005 dollars. Thus they can be aggregated into a summary value. This is the net social value which is total benefit less total cost.

As observed above, the net social value equals the sum of benefits to the producer(s), consumers, and third parties. In this case, the producer is effectively the Victorian Government. The relevant consumers are Victorian households. The third parties are Victorian businesses or households that experience gains or costs from the event. These component effects can be summarized as follows.

- Victorian Government: AGPC Grand Prix expenditures less receipts plus other government costs not paid for by AGPC.

- Victorian consumers: surpluses from attending the Grand Prix.

- Third party business effects: net increase in operating profits of Victorian firms and labour surpluses (if any).

- Third party household effects: these include benefits enjoyed by Victorian households from Grand Prix-related events and community costs associated with loss of park use and amenity, transport congestion, and noise.

In this analysis, all costs and benefits are assumed to occur within twelve 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.

Finally we note that the basic cost-benefit results in this report do not use a multiplier factor for any benefits. With good reason, this is standard practice in cost-benefit studies (see Department of Finance, 2006). When local resources are fully employed, expenditure of income surpluses from a project either increases imports directly or displaces other output (and so increases imports indirectly). When local resources are not fully employed, any expenditure (however inefficient) may be justified by a multiplier effect. This distorts the efficient choice of projects and allocation of resources. If there are unemployed resources, government should generally plan directly to reduce unemployed resources rather than adopt relatively inefficient projects.

However, multiplier benefits may occur when a project generates significant local income surpluses in the first round and there are significant local unemployed resources that may benefit from an increase in local expenditure that would not otherwise be employable. Accordingly, we examine possible multiplier effects and their implications in the discussion on sensitivity testing in section 5.2.

2.5 Interpreting the Results

As has been noted, a cost-benefit study estimates the welfare effects of a policy or event on a community. The aggregate result indicates whether the estimated welfare gains exceed the welfare costs. Sensitivity analysis shows how robust the estimates are to possible changes in data or assumptions.

Political judgments as to the desirability or otherwise of a policy depend also on as assessment of the distributional effects.

Such a welfare (cost-benefit) analysis is quite different from an economic impact study that attempts to estimate the effect of a project on gross state product. There are three main reasons for this difference.

First, estimates of GSP include gross payments to all additional labour employed. A cost-benefit study includes only the labour surplus, which is the difference between gross pay and what labour would require as compensation for working. There is a large difference between gross payments to labour and labour surplus.

Second, part of the Victorian GSP accrues to outside owners. A cost-benefit analysis that focuses on Victorian benefits excludes such benefits.

Third, GSP does not include many numerous consumer and community costs and benefits. These welfare effects are included in a cost-benefit analysis, at least when they can be quantified.

3 Costs of the 2005 Grand Prix

3.1 AGPC Construction and Operating Costs

As shown in Table 1, AGPC operating expenses in relation to the 2005 Formula 1 Grand Prix totaled $70.1 million. These costs are essentially expenditures on resources that could have been spent on alternative services.

Table 1 Formula One Grand Prix Expenses in 2005

AGPC Activity	$m
Event management and staging	32.3
Recurrent engineering [a]	22.4
Administration	6.4
Marketing/promotion and catering	9.1
Total operating expenses	70.1

(a) Costs associated with assembly, dismantling and servicing of 2005 Grand Prix.
Source: AGPC Annual Report (2005)

Five other points merit noting.

First, the costs include a substantial proportion of the expenses incurred by other public agencies on behalf of the operation of the Grand Prix. They include payments to: Parks Victoria, Vic Roads, the Department of Infrastructure, Police, the City of Melbourne and City of Port Philip, Ambulance and St. John.

Second, the costs include compensation for loss of profits 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) in the *Australian Grands Prix Ac 1994t.* 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.

Third, these costs include an allowance for depreciation. Generally, when capital expenditure is included in a cost-benefit analysis, depreciation is not included as this would involve double counting. In this analysis of the holding of the event in one year, depreciation is a relevant expense. Thus it is included although the accounting measure of depreciation may not be an accurate measure of the economic depreciation.

Fourth, 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 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).

Fifth, no capital works expenditures are included for the 2005 F1 Grand Prix. AGPC spent $2.85 million in 2005 in capital works for the 2006 Grand Prix. The AGPC also spent $3.4 million in 2004 for the 2005 Motorcycle Grand Prix but did not spend anything in 2004 for the 2005 Formula One Grand Prix.

3.2 Other Government Costs

As noted, the Auditor General wrote to the major agencies providing services to the AGPC (namely Vic Roads, the Department of Infrastructure, Melbourne and Port Phillip Councils, Metropolitan Ambulance Services, and Parks Victoria, as well as SES and MFES) to determine whether AGPC reimbursements adequately reflected all costs. The following summarises the available information.

Parks Victoria reported that its costs for the Grand Prix totaled $132,000. However, Parks Victoria is fully reimbursed for this along with receiving some income for loss of rents.[3]

In 2005, the Melbourne City Council spent a total of $333,615 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 $157,274, thus incurring a deficit of $176,341.

The St. Johns Ambulance reports that it has expenses totaling $64,000 that it does not recoup from AGPC.

The Save the Albert Park Group points out (correctly) that Treasury subsidises the Grand Prix by foregoing interest income on monies held by AGPC. However, as AGPS retains the interest income ($1.2 million in 2005), there is no net cost to government and it is not a cost in this analysis. On the other hand, the interest income retained by AGPC is not counted as a benefit in this analysis.

Accordingly costs borne by government that are not included in AGPC expenses are:

Melbourne City Council	$176,000
Parks Victoria	$ 64,000
Total	$240,000

[3] Treasury also granted $3.7 million to Parks Victoria to upgrade the sporting and recreational facilities in Albert Park with improved irrigation, sports pavilions and a running track. We understand that this expenditure is not related to the Grand Prix.

3.3 Community Costs: Land, Transport and Noise

Loss of park uses and amenity

Albert Park contains 225 hectares and is an active recreation park. Sporting facilities include 21 sports fields or playing ovals, the Melbourne Sports and Aquatic Centre, boating clubs and golf club. Informal recreational facilities include barbecues and picnic areas, and walking, cycling and jogging tracks. Attractions include at least 117 species of vegetation and over 100 bird species including significant wetland species (Parks Victoria, 2000).

The *Australian Grands Prix Act 1994* (the *Act*) allows the Albert Park Reserve to be closed partially to the public for 17 weeks from December to April to facilitate set up and take down of race infrastructure and to be closed totally for the race week. In practice, the event requires about a seven week construction period, one week for the races, and four week dismantling period.

The *Act* provides that the Park must be returned to Vic Parks in the condition in which it is received. Parks Victoria monitors this requirement and ensures that it is fulfilled.

According to the paper by Lansdell and Gangadharan (2003), there are 3.0 million visits to the Park per annum, including 1.3 visits for sporting purposes and 1.7 million visits for informal recreational. This represents an average of 6000 visits per week over the year.

Views differ about the impact of the Grand Prix on use of the Park. In a meeting on 14 August 2006, AGPC told the consultant that the event involved closure of about a dozen ovals for 4-6 weeks and the golf course for three weeks. Also, the Sports and Aquatic Centre and the tennis and bowling clubs are closed for the GP week.

An officer of Parks Victoria has pointed out that the Grand Prix takes place between the cricket and football seasons so that the inconvenience for the 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 (SAP) Group state that 19 sports fields or ovals are unplayable for between 4 weeks and 4 months, with an average unplayable period of about 9 weeks (SAP Newsletter, April 2003). In addition, 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 Table 2 below.

The Consultant has no means to determine the accuracy of these rival estimates of loss of Park use. Therefore, a compromise estimate is adopted. We assume that all uses of the Park are lost for two weeks and that half of all uses of the Park are lost for a further six weeks.

Table 2 Impacts of Grand Prix on Park use

Area in Park	FI Use	Impact
Sporting areas [a]		Unplayable for
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 etc.	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		
Coot picnic area (West)	Corporate accommodation	Compromised 8 weeks
Pelican picnic area (East)	Corporate boxes	Unusable 4-6 weeks
Picnic areas (West)	Fences compromise use	Compromised 6 weeks
Black Duck picnic area	Corporate boxes, gravel run-off	Unusable 5 weeks
Golf course	Event exhibitions	Closed 5 weeks
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 SAP.

Source: Save Albert Park Newsletter (April 2003)

Given an average of 6000 visits per week (ignoring possible seasonal issues), there is a loss of 30,000 visits due to the Grand Prix $((6000 \times 2) + (6000 \times 6 \times 0.5))$.

We also assume that the estimated 18,000 visitors $(6000 \times 6 \times 0.5)$ to the Park in the six weeks around the Grand Prix (principally before it) would experience significantly reduced amenity. 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 site as well as by the facilities themselves.

Based on the overall proportions of sporting and informal users, 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.

As has been noted 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 $5000 per club) appears low com-

pared 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.

In its 2005 report, NIEIR reported that the estimated value of lost park use during the week of the Grand Prix alone was $1.48 million in 2000 (based on its 2000 study). NIEIR stated that this estimate was based on 'the cost of activities foregone by residents or visitors seeking a second-best alternative with respect to their recreational and leisure activities (NIEIR, 2005, page 45). It is not clear how this estimate was derived. It implies a cost of about $250 per visit lost in Grand Prix week which is not a credible value parameter.

However, Lansdell and Gangadharan (2003) 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 very little surplus value from using the park. Those who have low travel costs have higher surplus value.

The authors obtain 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 $13.3 per park user.

This average value is quite low compared with an average value of $33 found in a survey of 200 recreational (travel-cost) studies in the United States ten years earlier (Walsh et al., 1992). However the American values were above this ($33) average for exotic 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, this report adopts the Lansdell and Gangadharan figure of $13.3 for lost uses and an amount of half this for reduced amenity. Similar and consistent figures are adopted for estimates of informal consumer surpluses for various Grand Prix experiences in Chapter 4.

Accordingly, our central estimate is that the Grand Prix has a community cost due to loss of use and amenity of the Park of $516,000. This equals (30,000 visitors not using the Park × $13.3) plus (18,000 visitors with reduced amenity × $6.50).

Noise Costs

Under the *Act*, the Grand Prix event is exempt from normal noise regulations. This does not mean that the 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 (1994), which estimated noise im-

pacts based on noise simulations and experience of the Grand Prix then held in Adelaide. Of course, engine technology has changed. One piece of correspondence provided to the Consultant indicated that current F1 cars are noisier than those in the early 1990s which had turbo chargers and fed some of the exhaust noise back through the turbo charger before release to the atmosphere. On the other hand, Grand Prix constructions may reduce the noise impact.

However, advice from Port Phillip Council 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.

Based on Vipac (1994) and as reported by the Doctors Working Group (1994), noise levels with the Grand Prix would be as shown in Box 1.

In addition to the actual race events, semi-trailers bring in an estimated 40,000 tonnes of infrastructure (for grandstands, corporate boxes and concrete barriers). There are ancillary loud entertainments (rock concert), loud speakers at 125-130 dB(A), and noise from traffic coming and going to the event, as well as from helicopters.

Box 1 Estimated noise levels with the Grand Prix

During Formula One race			
	Trackside	100 metres	200 metres
Maximum noise	125 dB(A)	105 dB(A)	101 dB(A)
High 5 minute average		95 dB(A)	93 dB(A)
Other racing events			
Maximum noise		91.5 dB(A)	91.5 dB(A)
High 5 minute average		85 dB(A)	83 dB(A)
Albert Road	Hourly daytime average		60.5 –64 dB(A)
	Maximum fairly continuous hourly noise		76 – 89 dB(A)
Queens Road	Hourly daytime average		70 – 72 dB(A)
	Maximum fairly continuous hourly noise		80 – 90.5 dB(A)
Canterbury Road	Hourly daytime average		70 – 72 dB(A)
	Maximum fairly continuous hourly noise		83.5 – 90 dB(A)

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

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 Councillor Logan (Port Phillip Council) indicates that about 7000 people (or 2500 households) reside within the 80 dB(A) line for the GP and that a fair number of these reside within the 90 dB(A) line. The Doctors Working Group (1994) 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 1000 vulnerable elderly residents reside in hostels or elderly accommodation within 500 metres of the track.

For this evaluation, we assume that all 2500 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.

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 (Boardman et al. 2006 and references therein). For the Grand Prix, we assume that noise impacts would cause weekly rentals (actual or imputed) of severely affected properties to fall by 20 per cent and the rents of other affected properties to fall by 10 per cent for one week.

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 four per cent rental return, this implies an average rental of $26,000 per annum or $500 per week. Combined with the cost assumptions above, the average noise disamenity cost would be $100 per 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.

Total noise costs for residents would be $415,000 for each Grand Prix event. This equals (2500 dwellings × $100) + (10,000 dwellings × 0.33 × $50). This does not allow any special costs for elderly persons in old-age accommodation or for patients in Alfred Hospital.

Transport Costs

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. Analysis is also hampered because traffic volumes on some key roads are uncertain.

The major traffic restrictions are as follows:

- Lakeside Drive is closed in off-peak peak periods for several weeks before and after event to facilitate construction and demounting. Lakeside Drive is closed for all hours for the week of the Grand Prix event.

- A Queens Road kerbside lane leading to Lakeside Drive is closed for four weeks before event.

- In Aughtie Road, stop-go traffic controllers control traffic for seven weeks before the event. Aughtie Road is closed completely for the Grand Prix week.

- Queens Road is closed one Sunday night early in the construction process to allow an overpass to Gate 8 at Roy Street to be constructed.

- 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 (AGPC, 2005).

Vic Roads informed the Consultant that Lakeside Drive carries about 15000 vehicles a day in both directions, including 6000 in off-peak hours.

On the other hand, Queens Road carries 84,000 vehicles a day, including about 4500 vehicles each way in peak hours. Vic Roads estimated that, in the race week, peak hour restrictions on Lakeside Drive add 500 vehicles per peak hour to Queens Road. Queens Road has six lanes between Union Street and Link Road and five lanes (with one land contra flow) between Link Road and Kings way.

There have been no travel time runs during the event. However Vic Roads and the Co-ordinator for Sustainable Traffic at Port Phillip Council 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.

However, some delays occur at intersections with Lorne Street and Link Road during and outside the race week. Also, it is 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 (2005) reported that most residents were able to shop with only minor inconvenience and estimated that the cost of using alternative routes was $0.13 million. NIEIR estimated that, of the 63,000 local residents, 3000 experienced shopping inconvenience in the week of the Grand Prix and 2000 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.

Estimates of transport costs due to the Grand Prix are hampered by a paucity of data on the effects. Therefore, the following are only indicative costs. Consider first the Grand Prix week. In this week 15,000 vehicles are diverted out of the park each day for seven days. We allow that this creates extra congestion for another 15,000 vehicles on the network, that each vehicle takes an additional 3 minutes, and that the travel time cost is $22 per vehicle hour ($0.37 per minute). Note that this cost parameter is based on Austroads (2005) and allows for more than one person in a car and for business travel as well as leisure travel. The congestion cost for the Grand Prix week would be $233,100.

Given that there is also some diversion and congestion cost in non-peak hours in the four 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.

Traffic accidents in Albert Park

Bannerman (2000) provides evidence that road accidents are higher per vehicle on the high-speed Grand Prix roads in the Park than they are on more conventionally engineered roads in other parks. Also the Save the Albert Park Group maintains that there remain a high number of non-recorded property damage accidents.

On the other hand, Parks Victoria states that casualty road accidents for which there are data are no longer (if they were ever) higher in the Park than elsewhere. After the Grand Prix, the AGPC re-engineers the kerbs for safety and water-filled barriers are placed in Aughtie Drive to reduce speeds and accidents.

In any case, following the logic of the brief for this report, additional accidents even if proven would not be included here because they would be a function of the existence of the Grand Prix track, not of holding the Grand Prix event in 2005. If additional accidents occur, however, they should be included in any long-run assessment of the Grand Prix.

Conclusions

We have estimated the community costs of the 2005 Grand Prix as follows:

Loss of park uses and amenity	$ 516,000
Noise costs	$ 415,000
Traffic diversion and congestion costs	$ 500,000
Total community cost	$1,431,000

As has been stressed, these are indicative costs. Given that these cost are borne predominantly by the local community around Albert Park they are a significant amount. However, they are small relative to the $70 million cost of constructing and running 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 cost-benefit analysis for the state of Victoria.

4 Benefits of the 2005 Grand Prix

4.1 Numbers of GP Spectators and State Visitors

The benefits of the Grand Prix are driven mainly by the numbers of spectators of the GP. As spectators they generate revenue for the AGPC and they may experience some consumer surplus. As visitors to Victoria, they may also generate extra local income in excess of the costs of production. Accordingly, we first summarise estimates of the numbers of GP spectators and state visitors.

In discussion with Applied Economics, AGPC estimated the following approximate attendance figures:

• Thursday 3 March 2005	70,000 (includes 30,000 free general admissions)
• Friday 4 March 2005	80,000
• Saturday 5 March 2005	100,000 – 110,000
• Sunday 6 March 2005	110,000 – 120,000
Total admissions over four days	360,000 – 380,000

According to the AGPC, on the week-end, there are 20,000 people in corporate areas, 35,000 in grandstands (when nearly full), and the balance is in general admission areas.

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 four days tickets, but can be used by anyone. General admission tickets are sold on a four-day and one-day basis, with most sold as a one-day ticket.

The Save the Albert Park Group (2006) contends that on the basis of its counting of entries and observations of grandstands these estimates are too high. In Appendix A, it estimates hat attendance over the four days totaled 266,500 (including 48,500; 57,000; 71,000 and 90,000 attendances over the four days respectively).

For the purpose of this evaluation, we have accepted the estimates by AGPC, but note that they may be on the high side. The implication of this is that international and interstate visitors (and their expenditure) may be overestimated. However, as discussed below, we believe that the estimates of GP-generated visitor expenditure given below are reasonable.

Total admissions exceed the number of separate persons attending because many people attend on more than one day, especially four-day ticket holders. As reported by NIER (2005), AGPC estimates the number of separate visitors (SV) with the following formula:

$$SV = 1.25 (A + B) + 2C + D \quad (1)$$

where A = the number of four-day general admission tickets
B = the number of four-day grandstand tickets
C = the number of corporate tickets
D = the number of one-day general admission tickets

According to NIER (2005), this formula generated 170,551 separate visitors.[4] Note that the formula (and the resulting estimate) does not include the free general admissions on 3 March 2005, which could involve up to an extra 30,000 visitors, but presumably nearly all local persons.

On the basis of about 2600 interviews of attendees[5], NIER estimated that there 23,606 overseas visitors and 32,503 interstate visitors, with the balance Victorians (see Table 3).

Drawing on their survey, NIER also estimated the numbers of overseas and interstate visitors who came to Victoria specifically because of the GP and the number of these visitors who stayed extra days because of the GP. These numbers are also shown in Table 3. In total, NIEIR estimated that the GP attracted 27,764 visitors to the state who would not have come otherwise and encouraged 2548 visitors to stay longer than they otherwise would have done.

In addition, the GP attracted nearly 3000 drivers, team members and officials to Melbourne and about 800 media representatives. Of these an estimated 2668 were from outside Victoria. Thus in total, including visiting spectators, the GP attracted an estimated 30,432 interstate and overseas visitors due to the GP.

Further to this, NIER (2005) estimated that these extra visitors spent a total of 174,034 visitor nights in Victoria (an average of 5.7 nights per visitor). NIER also estimated that the 2458 extended-stay visitors spend an extra 20,960 nights in Victoria (an average of 8.5 days extra).

Table 3 Estimated numbers of separate visitors (a)

Visitor Origins	Numbers	%	Came for GP	Stayed for GP
Melbourne	102,161	59.9		
Other Victoria	12,281	7.2		
Interstate	32,503	19.1	19,502	1149
International	23,606	13.8	8,262	1309
Total	170,551	100.0	27,764	2548

(a) Excluding GP teams and media.
Source: NIER, 2005.

[4] The number of ticket sales is confidential AGPC information and not known to us.
[5] NIER (2005) did 2760 interviews, but this included an unspecified number with media representatives and teams and drivers for the event.

Overall, NIEIR's estimates of international and interstate visitor and visitor nights seem realistic and are adopted in this report. As noted, total admission numbers may be high. Also, it is not clear why visitors staying on for the GP extend their stay for more than the four to five days for the GP. On the other hand, NIEIR estimates of visitors attracted specifically by the GP may be conservative, as NIEIR suggests.

4.2 Visitor and Sponsor Payments to AGPC

In 2005, the AGPC received $52.4 million in revenue from its commercial activities, made up as follows.

	($)
Sales revenue	41,475,055
Sponsorship and commercial revenue	10,885,958
Other operating revenue	78,547
Total	52,439,560

Source: Australian Grand Prix Corporation: *Annual Report 2005*.

This revenue represents a benefit to the Victorian Government (or taxpayer).

4.3 Victorian Consumer Surpluses

As has been noted, consumer surplus is the difference between what people are willing to pay for the GP experience and the price that they actually pay. When a seller tries to maximize revenue and adopts price discrimination strategies, consumer surpluses may be quite low. 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.

To estimate consumer surpluses, ideally a demand 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 (ACT Auditor-General's Office, 2002). 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 (2001) 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.[6]

[6] The ACT Auditor-General's Office (2000) allowed for a 28 per cent increase in consumer surplus for the 2001 V8 event because prices had been reduced and ticket revenue was 28 per cent higher in 2000 than in 2002.

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

We consider therefore that an assumption that consumer surplus is about 12 per cent of ticket revenue from sales to Victorians is reasonable. (Any consumer surplus of non-Victorians is not relevant).

As shown in Table 3, an estimated 67 per cent of spectators are Victorian residents. It follows that the consumer surplus of Victorian residents was ($41.5 million × 0.67 × 0.12) = $3.34 million.

To validate this, we note that of the approximate total of 330,000 paying attendances over the four days, 67 per cent were by Victorians. Thus there were some 221,000 attendances by Victorians. Our estimate of consumer surplus implies that the average consumer surplus was $15.1 per Victorian attending the Grand Prix.

In addition, an estimated 30,000 Victorians attended free on Thursday, 3 March. Allowing a willingness-to pay value of $15 per head, including children, for the more modest Thursday events, the consumer surplus for this day was $450,000.

On these assumptions, total consumer surplus for Victorians was $3.79 million.

4.4 Benefits to Victorian Businesses

Benefits during the Grand Prix period

Table 4 shows estimated expenditures per trip and per night by visitors to Victoria excluding air fares and expenditures on GP 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 in the table include expenditure at the Grand Prix.

Table 4 Estimated expenditures by interstate and international visitors (a)

	Extra visitors		Stay-extenders		Other visitors	
	Per trip	Per night	Per trip	Per night	Per trip	Per night
Interstate	1248	275	1490	277	1340	201
Overseas	1564	196	2175	193	2301	132

(a) Expenditure excludes airfares and expenditure on GP tickets.
Source: NIEIR, 2005.

Table 5 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	668[b]	3,593[c]	2.4
GP teams	2,000[b]	7,950[c]	15.9
Total			60.0

(a) Excludes purchase of GP tickets.
(b) Assumed break-up of 2668 media and GP team visitors.
(c) NIER total figures divided by estimated numbers.

Table 5 shows the additional expenditures in Victoria. The figures for the basic visitor groups are based on the numbers shown in Tables 3 and 4. The figures for media and GP team expenditure are taken from the NIEIR report. The amounts total $60.0 million. This is lower than the NIER estimate of $73.9 million, which included expenditures on GP tickets and parts of air fares.

Equation (2) shows how operating surpluses (π) after tax may be estimated.

$$\pi = [\Delta E \times (1\text{-}IT] \times (1 - CI) \times (1 - DT) \qquad (2)$$

where ΔE is the increase in expenditure, 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 profit tax rate.

Suppose plausibly that IT = 0.10, CI = 0.7, and DT = 0.3, the operating surplus after Commonwealth taxes would be 19 per cent of the change in expenditure.

Note however that this presumes that firms will increase output to meet the extra demands. Some firms may meet new demands by redirecting output. A restaurant that is full on Saturday nights may service new demands by reducing service to existing customers. In this case there would be minimal, if any, increase in local expenditure or increase in operating profit.

Now suppose also that the cost of inputs (CI) above include expenditure on employing additional labour equivalent to twenty per cent of revenue less indirect tax and that this labour would be willing to work for only 50 per cent of the wage paid. In this case the workers would receive surplus) equivalent to 9 per cent of the increase in expenditure ($\Delta E \times 0.9 \times 0.2 \times 0.5$).

To gain insight into possible operating profit margins, the Consultant held discussions in Melbourne with Tourism Victoria, the Victorian Employers Chamber of Commerce,

and Restaurant and Catering Victoria. However, none of these organizations could provide an estimate of the operating profit per marginal dollar of tourism expenditure.

Several people observed that the tourism industry is highly competitive, with easy entry and very low profits.[7] It was also pointed out there is a shortage of skilled staff (chefs) and that wages for out-of-hours work with penalty rates are significant. In addition, in areas like catering for special events, there are low fixed costs and relatively high operating costs relative to revenue.

On the other hand, the low profits to some extent reflect excess capacity in the industry. There are 7000 licensed restaurants in Victoria and many unoccupied seats. This suggests that there could be significant marginal operating profit in this sector. Low long-run average profits are not inconsistent with high marginal operating profits in an industry with excess capacity.[8]

These observations imply that attracting more resources into the tourism sector in the long run is not an efficient use of resources. However, increasing demand for tourism services in the short run is beneficial (providing it does not attract more resources to the industry in the long run).

Turning to quantitative analysis, Dwyer et al (2004) provide the most detailed Australian study of the effects of additional tourist expenditure on state output and welfare that we are aware of. The authors use the Monash computable general equilibrium model to estimate the impact of a 10 per cent increase in tourist expenditure (after GST) on gross state product and on net productive benefits in New South Wales.

They estimate that for a 10 per cent increase in international expenditure ($636 million), there would be an increase in gross state product of $364 million (the difference between expenditure and product reflects imports to the state and crowding out of other economic activity) and a net benefit of $96 million. Equivalent figures for interstate tourist expenditure are $540 million, $322 million and $101 million.

In other words the net benefit to the state is 15.1 per cent of gross international expenditure and 18.7 per cent of interstate expenditure. These estimates of increases state output are very sensitive to the extent to which the extra expenditure does not crowd out existing activities and the availability of additional labour. The estimates of net benefit are also sensitive to assumption about spare capacity.

In another analysis of this issue, Forsyth (2005) estimated that the net benefits of increased international tourism across the Pacific amounted to only 6.1 per cent of additional expenditure in New South Wales and to 6.9 per cent of additional expenditure in Australia.

[7] Technically, these are accounting profits or a return on equity capital. This report is concerned with economic profits, which is the surplus after all inputs have been paid their opportunity cost.
[8] Formally this is often a feature of a monopolistically competitive industry.

Drawing on both these studies as well as on Equation (2) and the related qualitative arguments above, for the central assessment in this report we allow that there is an operating surplus of 15 per cent of generated international and interstate revenue. Allowing for $55 million in additional local expenditure after indirect taxes, the operating surplus for Victorian firms would be $8.25 million.

In addition there may be small labour surpluses associated with additional employment. However, the surpluses are likely to be small because firms in the tourism industry generally pay low wages that are not significantly in excess of labour reservation prices. For the purpose of this evaluation, we assume that firms pay 20 per cent of the extra income of $55 million to employ additional labour and that these payments exceed minimum wage requirements by 10 per cent. On these assumptions, there would be a benefit of $1.1 million to additional employment.

In total, the 2005 Grand Prix would have generated extra local incomes of $9.35 million.

Benefits after the Grand Prix period

The Consultant understands that the Grand Prix is designed as part of an overall Victorian strategy to market the state as a place where major events are well run and to leverage additional tourism benefit off this image. In particular it is claimed that the Grand Prix provides worldwide television exposure showing Melbourne as a vibrant and attractive city and that this is likely to generate tourism separately from the Grand Prix.

However, based on out discussions in Melbourne, it appears that there has been no survey of the effects of this advertising and no statistical analysis of the impacts of the Grand Prix on tourists.

As noted in Chapter 1, this evaluation is an assessment of the holding of the 2005 Grand Prix. It is the view of the Consultant that holding the 2005 Grand Prix would have had small, if any, impact on the future number of tourists visiting Victoria.

For the evaluation, suppose that an additional 1000 tourists were generated spending $2000 per head and that the Victorian operating surplus was 15 per cent of expenditure. The gain to Victoria would be $300,000 (= 1000 × $2000 × 0.15).

4.5 Other Benefits to Victorians

Other indirect benefits to Victorians

Victorians, principally residents of Melbourne, also gain consumers surpluses from watching the Formula One parade in the City, the television displays and parties in Fed Square, and even from watching the event in hotels and pubs and own sitting rooms. In each case, Victorians are preferring to do this rather than an alternative.

There is no data on how many people are involved or what value they place on these activities rather than on the alternative. However, for the sake of providing a complete calculus, we assume that there some 200,000 local residents (roughly the same number of Victorians as visit the Grand Prix itself) take part in such informal and indirect activities and gain an average consumer surplus of $10 from this. It may be noted that this amount of consumer surplus for an activity is consistent with other values used in this paper, for example with the consumer surpluses lost by alienation of Albert Park for other uses. On this basis, the indirect benefits would have a value of $2.0 million.

Civic pride and other non-use values

As we have noted, 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 given their overall budget constraints. It is important that, in responding to such questions, households 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 (2002) pointed out, some members of the community may consider that major motor car races within cities detract from urban quality more than they contribute.

It seems that no useful purpose would be served by attempting to impute such non-use values. It suffices to observe that if, and so far as, the estimated costs of the Grand Prix are higher than its estimated use benefits, there may still be a case for supporting the Grand Prix on non-use, civic value, grounds.

5 Overall Cost-Benefit Result for 2005

5.1 Cost-Benefit Outcome for Victoria

The results estimated above for the 2005 Grand Prix are summarized in Table 6.

The estimated costs total $71.7 million. The costs of constructing and running the event constitute 98 per cent of the costs. Although the community costs of loss of park use and amenity, transport congestion and noise are significant locally, they are only 2.0 per cent of total estimated cost.

The estimated benefits total $67.9 million. Payments to the AGPC represent 77.2 per cent of the total. Estimated benefits (net surpluses) to Victorian firms and labour represent 14.3 per cent of the benefits. Estimated direct and indirect consumer surpluses make up the other 8.5 per cent of the benefits.

Accordingly the estimated net social benefit is -$3.8 million and the benefit-cost ratio is 0.95. These results imply that the estimated costs exceed the benefits to Victoria by 5 per cent. However, the estimated benefits do not include non-use values.

Table 6 Costs and Benefits for Victoria

Costs and Benefits	$m
Costs	
GP construction and operation costs [a]	70.1
Other GP-related government costs	0.2
Loss of park uses and amenity	0.5
Transport congestion	0.5
Noise costs	0.4
Total quantified costs	71.7
Benefits	
Visitor payments to AGPC	41.5
Sponsor payments to AGPC	10.9
Victorian visitor consumer surpluses	3.8
Net profit to Victorian businesses during GP	8.3
Net profit to Victorian businesses after GP[b]	0.3
Generated labour surpluses	1.1
Other consumer benefits of Victorians	2.0
Total quantified benefits	67.9
Net Benefit	-3.8

(a) Costs borne by AGPS which include some expenses borne initially by various other Victorian Government agencies.

(b) As these benefits are small, they are not discounted although they may occur in a later year.

5.2 Sensitivity Analysis

These results appear robust. On the one hand, most of the costs are demonstrably costs to Victoria. Although the estimated community costs of $1.4 million in total (park loss, congestion and noise) are order-of-magnitude estimates, varying these costs up or down by 50 per cent ($0.7 million) makes little difference to the total cost.

Turning to the benefits, payments to AGPC (nearly 80 per cent of the estimated benefits) are again a known figure. Also, in our judgment, the estimates of consumer surpluses seem plausible and are unlikely to be significantly undervalued.

The main uncertain benefits values are profits to Victorian firms and surpluses to Victorian labour. The report attributes $9.4 million benefits to these two groups compared with estimated generated expenditure in Victorian of $55 million. Bearing in mind the import content of goods, the other costs of providing extra goods and services and the Commonwealth income tax, in the view of the report, an upper limit of the combined business benefits to Victorian would be 25 per cent of this generated expenditure which would be $13.75 million. If this were achieved, the costs and benefits of the Grand Prix would be approximately equal.

Finally, we consider possible multiplier (flow-on) effects. Flow-on benefits (ΔB) may be represented by:

$$\Delta B = \Delta Y.M \qquad (3)$$

where ΔY is the net increase in primary local income after tax, and M is the *marginal multiplier*, which can be approximated as follows:

$$M = 1 / (1 - (1 - S - I - T)) \qquad (4)$$

where S is the proportion of local income that is saved, I is the proportion of expenditure on imported goods and services, and T is the proportion of income taken in Commonwealth taxes. The multiplier is related negatively to these three leakages. The higher are these leakages, the lower is the multiplier. When local employment is high, there is a high leakage to imports. When ($S + I + T$) sum to one, the multiplier is 1.0, which implies that there is no multiplier.

The net increase in local primary income from the 2005 event is estimated as follows:

Changes in primary income	$m	
Government income	- 17.9	(= $52.4 million - $70.3 million)
Trading profit	+ 8.6	(= $8.3 million + $0.3 million)
Extra labour income[a]	+11.0	(=$55.0 × 0.20)
Total increase in primary income	+ 1.7	

(a) In this case, gross additional labour income is the relevant income.

Evidently, even with local trading profits and additional gross employment income, the increase in primary income due to the Grand Prix is small. We estimate it to be $1.7 million. This is because the public sector loses money on the event.

Nor is the marginal multiplier likely to be high. Note that marginal *M* is greater than average *M* because imports rise as a community approaches full employment. Suppose that $S = 0.10$, $I = 0.4$, and $T = 0.3$, then $M = 1.25$.

In this case, the flow-on benefits would be $2.12 million.

As indicated in section 2.4, multiplier (flow-on) benefits are not usually included in cost-benefit studies. However, in this case, flow-on benefits would be low because there is little generation of net primary income.

5.3 Distributional Analysis

The major distributional effects are shown in Table 7. The costs are borne by Government and by local households. The benefits accrue to Victorian businesses (as a group) and to Victorian households as consumers and to a lesser extent as workers.

However, as NIEIR and the Save the Albert Park Group have shown, the impact on businesses in Melbourne is variable. NIEIR (2005) 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. The Save the Albert Park (correspondence) reported that, in the Grand Prix period, 45 per cent of respondents indicated business was down, 25 per cent stated that it was increased, and 29 per cent stated that it made no difference.

Table 7 Main distributional effects

Victorian agency / party	$m
Government	-17.9
Local households	- 1.4
Victorian businesses	+ 8.6
Victorian labour	+ 1.1
Victorian consumers	+ 5.8
Total	- 3.8

6 Concluding Observations

6.1 Cost-Benefit Analysis of the Grand Prix in the Long Run

As has been noted, this paper reports a cost-benefit study of the holding of the 2005 Grand Prix. This was essentially study of a short-run decision. 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 small ways. These would include the following.

- In a long-run study, capital expenditures on behalf of the Grand Prix would be included. In this study there were no relevant capital expenditures. On the other hand, depreciation expenditures are included in this study and would not be included in a long-run study.

- In a long-run study, options to restore or upgrade Albert Park would be considered along with both the expense of the upgrade but also the higher costs of using the park for a Grand Prix race track.

- Likewise, in a long-run study, the Grand Prix track could be redesigned as a local park road with possible safety improvements. This was not considered in this short-run study.

- In this study it was assumed that businesses in the tourism industry would benefit in the period of the Grand Prix by using spare capacity. However, if the Grand prix were to attract more investment in the low profit tourism industry in the long run, the annual benefits in the long run could be lower.

- In a long-run study, more consideration might be given to the ongoing tourism generation effect. In this study the effect of one Grand Prix on the numbers of future tourists was assumed to be small. However, to assess the long-run tourism effect, the effect of the Grand Prix as a marketing instrument would need to be evaluated.

6.2 Cost-Benefit and Gross State Product Analyses

In the short run, the change in gross state product (ΔGSP*)* is a function of changes in expenditure in the state less imports. Assuming Victorian government and household expenditure are unchanged, ΔGSP depends on additional international and interstate expenditure less imports. In these calculations, the expenditure increase is $55 million.

However, the extent to which this extra expenditure results in extra state output in the short run depends on how much of this extra expenditure in goods and services in Vic-

toria is met by additional local production, because there is spare capacity or by employing extra labour, and how much by imports of goods and services.

In addition, the increase in output needs to be assessed against a counterfactual case. If there is spare productive capacity, the Victorian Government could increase public expenditure by borrowing and thus increase gross state output.

In relation to the cost-benefit analysis, increased output is not itself a welfare benefit. It is only a benefit in so far as it produces higher returns to land, capital or labour. These estimated benefits are included in the cost-benefit analysis. Gross output is not included in the cost benefit analysis.

On the other hand, a cost-benefit analysis includes consumer surpluses that are not included in GSP.

In the longer run, the effects on the Grand Prix event on GSP depend also on the relative investment productivity of the public expenditure. An expenditure of $70 million on education that enhances human capital stock or on transport network that facilitates transport movements and reduces transport costs may increase GSP by more than the equivalent expenditure on a sporting entertainment.

6.3 Cost-Benefit Analysis for Australia

The cost-benefit analysis of the Grand Prix for Victoria differs in two main ways from a cost-benefit analysis for Australia.

First, about two-thirds of the profits to Victorian firms and labour arise because interstate visitors spend less in other parts of Australia. These business and labour profits represent a possible transfer of profits and income from other parts of Australia and would not be included in an Australian cost-benefit study.

On the other hand, the consumer surpluses of interstate visitors would be included in an Australian study.

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