Public Report

Total cost review of regular bus services operated in Sydney’s four largest regions

Prepared for:
The Independent Pricing and Regulatory Tribunal NSW (IPART)

September 2009
CONTENTS

Management Summary

1. INTRODUCTION .................................................................................................................................................1
   1.1. Purpose of this Review.......................................................................................................................................1
   1.2. Scope of Work ....................................................................................................................................................1

2. EFFICIENT OPERATING EXPENSE (OPEX) ..............................................................................................2
   2.1. Stage 1 – Preliminary Normalisation...............................................................................................................2
   2.2. Stage 2 – Allocation of Cost Differences .........................................................................................................3
   2.2.1. Overview of Sources of Additional Efficient Costs ......................................................................................3
   2.2.2. Overview of Sources of Inefficient Costs ......................................................................................................4
   2.2.3. Constraints on Addressing Inefficient Costs .................................................................................................5
   2.3. Stage 3 – Transition to a more Efficient Cost Structure ...................................................................................6

3. EFFICIENT CAPITAL EXPENSE (CAPEX) .................................................................................................9

4. BENCHMARKING ..................................................................................................................................................12

5. SCHOOL TRAVEL .............................................................................................................................................17

6. MARGINAL COST ANALYSIS ......................................................................................................................19
   6.1. Fixed and Variable Costs ....................................................................................................................................19
   6.2. Marginal Cost of Patronage Growth ................................................................................................................20
Management Summary

The Independent Pricing and Regulatory Tribunal (IPART) is currently reviewing fares for Sydney metropolitan and outer metropolitan bus services from January 2010. Under its proposed approach, IPART will consider the cost of an efficient operator to provide the contracted services in the four largest Sydney metropolitan contract regions. The four largest contract regions in the Sydney metropolitan area are regions 6, 7, 8 and.

Purpose

As part of the IPARTs current review of metropolitan bus fares, IPART will determine how much revenue is required annually to provide the contracted bus services in the four largest regions based on forecast efficient operating and capital costs to deliver the necessary quantity and quality of services specified in the service contracts. The purpose of this review is to estimate the efficient costs of providing regular passenger bus services for fare paying passengers in the four largest regions.

Efficient Cost

The estimated efficient operating and capital costs associated with the provision of regular passenger services in regions 6, 7, 8 and 9 has been derived from the results of extensive benchmarking and consideration of a number of unique operating environment factors.

For the purpose of this review, the definition of the efficient cost for providing regular bus services in regions 6, 7, 8 and 9 is that cost which:

► is at the lowest sustainable level for the operator to meet all its obligations with respect to providing regular passenger bus services for fare paying passengers;

► is at a level which allows the operator to meet its service contract obligations including safety, punctuality, reliability and availability, cleanliness, and environmental and other regulatory compliance;

► allows the operator to meet the reasonable expectations of its employees and unions; and

► meets the reasonable requirements of its shareholders or owners, without having to compromise on delivering on its obligations.
Indec’s recommended level of efficient operating expenditure associated with providing passenger journeys for paying passengers in the four nominated regions has been determined using a three stage process:

**Stage 1**

Indec has identified the difference between operating costs for the four regions 6, 7, 8, and 9 and those of its hypothetical “efficient benchmark operator”. The efficient benchmark operator is based on a weighted average of efficient Sydney, Melbourne, Perth and Adelaide operators\(^1\). Whilst the comparison of the operators is normalised for operating conditions such as speed, fuel, charter, tolls and spread of service hours, benchmarking is unable to differentiate in detail between the service contracts and specific operating requirements in the nominated regions and those of other bus operators. This adjustment is made in step 2.

**Stage 2**

Indec has categorised and quantified the causes of difference between the operator of the four largest regions’ costs and the efficient benchmark. Many of the cost differences are a result of the operational requirements that cannot be normalised for in stage 1 and so would be experienced by any operator contracted to provide services in regions 6, 7, 8 and 9. On the other hand, some cost variances result from apparent inefficiency in certain areas of operation. These inefficiencies have been identified through observation, analysis and extensive consultation with the bus operator’s management. Some cost differences fall somewhere in between these two categories and allocation to a given category has been based on Indec’s best judgement in consultation with the operator of the four largest regions and in discussion with IPART with reference to the ultimate purpose of this review.

**Stage 3**

In consultation with the operator of the four largest regions, Indec has identified a range of potential savings initiatives which provide scope for improving cost efficiency over the short, medium and long term. The savings initiatives have been considered within existing technological, managerial and Government policy constraints on moving toward efficiency. Indec’s experience in these matters is that during implementation of productivity measures, outcomes can be uncertain and sometimes savings will not be achieved in some target areas but may materialise in other sections and cost categories.

**Key results**

\(^1\) Indec considers that a hypothetical efficient operator based on a normalised weighted average of private operators in metropolitan Sydney, Melbourne, Perth and Adelaide is a suitable comparator. Indec has therefore utilised data from those operators/jurisdictions as the basis for constructing its weighted efficient benchmark.
The list of cost saving measures below is based on robust estimates which indicate that the potential annual cost saving associated with these measures by 2013/14 totals $41.77 million. The transition path incorporating this suite of tangible measures that are capable of being gradually implemented may enable the bus operator to move from its present cost structure towards a more efficient cost structure over the medium term (five years). The impact of the stage 1 and 2 adjustments and the savings transition path are illustrated in table M-1.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Indec Recommended</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient OPEX Benchmark</td>
<td>365.30</td>
<td>375.82</td>
<td>383.03</td>
<td>388.61</td>
<td>394.57</td>
<td>400.66</td>
</tr>
<tr>
<td>Costs associated with operating region 6-9</td>
<td>65.67</td>
<td>67.93</td>
<td>68.58</td>
<td>69.26</td>
<td>69.94</td>
<td>70.64</td>
</tr>
<tr>
<td>Inefficiencies</td>
<td>47.54</td>
<td>49.71</td>
<td>50.61</td>
<td>51.53</td>
<td>52.47</td>
<td>53.43</td>
</tr>
<tr>
<td><strong>Indec Recommended</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient Cost</td>
<td>430.97</td>
<td>443.75</td>
<td>451.61</td>
<td>457.87</td>
<td>464.51</td>
<td>471.29</td>
</tr>
<tr>
<td>Transition to Indec Efficient Cost</td>
<td>478.51</td>
<td>493.21</td>
<td>492.42</td>
<td>491.01</td>
<td>488.13</td>
<td>482.95</td>
</tr>
</tbody>
</table>

*Note: Columns/rows may not add due to rounding*

Table M-1  Indec Recommended Operating Expenditure
for Regions 6, 7, 8 and 9 ($ million real 2009/10)

**Acknowledgements**

Many parties contributed to this review, some of whom are mentioned in this report. However, Indec wishes to especially acknowledge the generous cooperation and assistance of management and staff of the State Transit Authority NSW.

Indec also wishes to acknowledge the generous assistance of the Victorian Department of Transport and in particular the Deputy Director of Public Transport - Bus and Regional Services.
1. **INTRODUCTION**

The Independent Pricing and Regulatory Tribunal (IPART) is currently reviewing fares for Sydney metropolitan and outer metropolitan bus services from January 2010. Under its proposed approach, IPART will consider the cost of an efficient operator to provide the contracted services in the four largest Sydney metropolitan contract regions. The four largest contract regions in the Sydney metropolitan area are regions 6, 7, 8 and 9.

1.1. **Purpose of this Review**

As part of the Tribunal’s current review of metropolitan bus fares, the Tribunal will determine how much revenue is required annually to provide the contracted bus services in the four regions based on forecast efficient operating and capital costs to deliver the necessary quantity and quality of services specified in the service contracts. The purpose of this review is to estimate the efficient costs of providing regular passenger bus services for fare paying passengers in the four largest regions.

1.2. **Scope of Work**

The scope of work associated with this review incorporated extensive consultation with the operator of the four largest regions, NSWTI, BusNSW and selected operators and included:

- providing a draft methodology report to the Tribunal for approval. The report incorporated a detailed outline of the approach for each component of the consultancy;
- benchmarking analysis comparing the operator of the four largest Sydney regions’ costs with the costs of other Australian operators (including Melbourne, Brisbane, Canberra, Adelaide, Hobart and Perth, and selected international operators for which data was available);
- recommending efficient operating and capital cost estimates for regions 6, 7, 8 and 9 for each of the five calendar years from 2010 to 2014.
- quantifying the size of any ‘cost efficiency gap’;
- based on consultation with the bus operator, identifying any causes of inefficiency, constraints on moving toward efficiency and the scope for improving cost efficiency over the short, medium and long term given existing constraints;
- identifying a transition path towards an efficient cost structure over the medium term (five years), incorporating a suite of tangible savings measures that are capable of being implemented;
- estimating efficient marginal cost; and
- providing an estimate of the fixed costs of operating a bus and the variable costs of operating a bus in contract regions 6, 7, 8 and 9.
2. EFFICIENT OPERATING EXPENSE (OPEX)

The estimated efficient operating and capital costs associated with the provision of regular passenger services in regions 6, 7, 8 and 9 has been derived from the results of extensive benchmarking and consideration of a number of unique operating environment factors.

The aim of this analysis is to determine the efficient costs of operating the regions 6, 7, 8 and 9 for fare paying passengers regardless of ownership structure of the operator(s) servicing those regions. For the purpose of this review, the definition of the efficient cost for providing regular bus services in regions 6, 7, 8 and 9 is that cost which:

► is at the lowest sustainable level for the operator to meet all its obligations with respect to providing regular passenger bus services for fare paying passengers;

► is at a level which allows the operator to meet its service contract obligations including safety, punctuality, reliability and availability, cleanliness and environmental and other regulatory compliance;

► allows the operator to meet the reasonable expectations of its employees and unions; and

► meets the reasonable requirements of its shareholders or owners, without having to compromise on delivering on its obligations.

Indec’s recommended level of efficient operating expenditure associated with providing passenger journeys for paying passengers in the four nominated regions has been determined using a three stage process:

2.1. Stage 1 – Preliminary Normalisation

Indec has identified the difference between operating costs for the four regions 6, 7, 8, and 9 operated and those of its hypothetical “efficient benchmark operator”.

The efficient benchmark operator is based on a weighted average of efficient Sydney, Melbourne, Perth and Adelaide operators. Whilst the comparison of the operators is normalised for operating conditions such as speed, fuel, charter, tolls and spread of service hours, benchmarking is unable to differentiate in detail between the service contracts and specific operating requirements in the regions and those of other bus operators. This adjustment is made in step 2.

---

2 Indec considers that a hypothetical efficient operator based on a normalised weighted average of private operators in metropolitan Sydney, Melbourne, Perth and Adelaide is a suitable comparator. Indec has therefore utilised data from those operators/jurisdictions as the basis for constructing its weighted efficient benchmark.
2.2. Stage 2 – Allocation of Cost Differences

Indec has categorised and quantified the causes of difference between the operator of the four largest regions’ costs and the efficient benchmark. Many of the cost differences are a result of the operational requirements that cannot be normalised for in stage 1 and so would be experienced by any operator contracted to provide services in regions 6, 7, 8 and 9. On the other hand, some cost variances result from apparent inefficiency in certain areas of the operator’s operation. These inefficiencies have been identified through observation, analysis and extensive consultation with the bus operator’s management. Some cost differences fall somewhere in between these two categories and allocation to a given category has been based on Indec’s best judgement in consultation with the bus operator and on discussion with IPART with reference to the ultimate purpose of this review.

2.2.1. Overview of Sources of Additional Efficient Costs

Operating conditions in the four largest contract regions are characterised by high levels of traffic congestion, a high passenger density and a winding geographical topography that the efficient benchmark operator is not subject to. In addition, the current service contracts for these four regions require the operator to undertake additional activities that benefit passengers in these regions. Indec found that these characteristics result in additional efficient hourly, kilometre and overhead costs in these regions.

Hourly costs

The timetables in the four largest regions mean that the operator is required to provide a greater proportion of services late at night and on weekends and public holidays compared to the benchmark operator. In addition, the higher levels of congestion and higher passenger density mean that drivers in these regions are subject to more demanding conditions. As a result, the operator is required to:

► pay additional penalty rates to drivers operating late at night and on weekends and public holidays;

► pay a shift allowance and provide more training to drivers so they can drive articulated buses (which can carry up to twice the number of passengers than a standard bus) and drive on the more congested, narrower streets in these regions; and

► pay a small number of bus depot parking drivers to park buses at the more congested depots used in these regions.

Kilometre costs

Kilometre costs largely comprise fuel and maintenance costs. The higher levels of congestion and passenger density in the four largest regions result in additional efficient kilometre costs due to:
higher fuel, tyre, accident and maintenance costs caused by greater levels of starting and stopping;

higher maintenance costs associated with articulated buses and buses with central doors (required to carry greater numbers of passengers, and allow passengers to get off buses faster); and

higher bus maintenance costs due to the use of buses that run on compressed natural gas to reduce pollution emissions

higher costs associated with maintaining reasonable standards of comfort and safety for passengers on more crowded buses and buses operating late at night (such as air conditioning, cleaning and CCTV costs).

**Overhead costs**

The particular operating environment in the four largest regions also results in additional efficient operating costs, as it means the operator must:

- use prepaid ticketing technology to enable passengers to board buses faster;
- pay higher CTP insurance costs;
- undertake more integrated traffic and transport planning, as well provide more information to passengers (such as timetables, information booths and management of special events); and
- meet other costs required under the service contracts in these regions including revenue.

Types of costs that Indec considers a requirement of the operating requirements in the four largest regions include the use of articulated buses and centre doors on buses. These measures allow the operator to transport a higher number of passengers per bus and load/unload passengers more quickly. The benchmark operators do not require these types of buses due to less congested operating environments and lower passenger densities. Note that by any unit of measure the operator of the four largest regions carries twice as many passengers as the hypothetical efficient operator. Other related examples include higher bus refurbishment and cleaning costs caused by higher passenger numbers, prepaid ticketing technology and accident costs that exceed average costs caused by higher and ever increasing levels of congestion. The network related adjustments consist of three key operating cost categories including driver costs of $5.52 million (Bus Hourly costs), distance costs of $29.34 million (Bus Kilometre costs) and overhead costs of $30.80 million (Bus Overhead Costs).

### 2.2.2. Overview of Sources of Inefficient Costs

Indec has identified that the operator of the four largest regions’ main area of apparent cost inefficiency relates to driver working conditions. For example, this operator provides relatively
generous leave provisions for drivers when compared to the efficient operator average and has a lower than efficient level of driver utilisation. Other examples include inefficiency due to working conditions of administration staff and mechanics, and more onerous governance and procurement practices than would be the norm among efficient operators in the bus industry.

In terms of procurement and tendering, Indec acknowledges that the operator of the four largest regions is subject to procurement processes within State Government agencies. These policies have been instituted to ensure that the government gets the best outcomes possible while ensuring that all agencies are able to meet the strictest level of probity and public scrutiny. Specifically, the operator of the four largest regions is subject to the January 2005 NSW Government procurement policy, which is expected to be revised shortly. As is the case for all NSW Government agencies, compliance costs with procurement policies are high.

Indec also notes that the operator of the four largest regions incurs significant governance costs. These activities include writing ministerials, preparation of annual report and papers for the Director-General, Minister, Cabinet, and participation in interagency activities, and participating in or undertaking internal and external audits. Responding to Government imperatives and exercises such as Estimates Committee, External Audit (working papers) etc. is a major consumer of resources. The operator of the four largest regions also has a Board and is subject to governance legislation (Transport Administration Act), reflecting the significant accountability provisions applying to NSW Government agencies. These accountability provisions include ICAC, Audit Office, Ombudsman, Central Agencies, Premiers Department and Treasury and a large number of regulators monitoring State Transit activities, including NSW Transport and Infrastructure, IPART, Office of the Transport Safety Investigator (OTSI), Independent Transport Safety and Reliability Regulator, RTA, NTC (Natural Transport Commission), Workcover, DECC (Environmental regulations).

Being a Government owned and operated agency requires a high level of 'control' over function deemed critical by the Government. In this context there is little appetite or tolerance for risk in any of the operator of the 4 largest regions’ critical functions. Finance functions must adopt high standards of internal control (documentation, segregation of duties, security etc). All finance functions are periodically reviewed for compliance by Internal Audit, the NSW Audit Office, Quality System Auditors (ISO 9001) and NSWTI auditors. A large borrowing program and significant foreign currency transactions dictate a robust Treasury management function (forward exchange contracts; interest rate swaps; Tcorp management services; credit risk assessments; capital structure studies). These activities are managed very effectively through a combination of internal resources and outsourced arrangements.

2.2.3. Constraints on Addressing Inefficient Costs

The operator of the four largest regions faces a number of constraints which may be an impediment to addressing the inefficiencies that have been identified in this review. In particular it
has a number of inefficiencies which largely relate to differences in award conditions and associated costs between Sydney Buses and an efficient operator. The operator of the four largest regions would not be able to readily reduce the cost gap in award related cost categories unless there is strong Government support for such measures. For instance, there are significant differences in payroll leave provisions. Indec further understands that the non-leave driver utilisation cost gap is directly related to award conditions. Non-leave driver utilisation includes differences in sign-on/off, Work As Directed (WAD) and other gaps such as meal breaks. There are a number of other differences in awards for bus drivers, not all of which have been costed. For instance, there are some also some key differences between the provisions of the bus operators’ award for casual drivers and that of the State award. There are a range of other restrictions in the bus operators’ award on the use of casuals which do not apply to the State award.

Indec understands that the operator of the four largest regions would not be able to readily reduce the cost gap in governance related cost categories identified in section 2.2.3 unless there is strong Government support for such measures.

Another constraint relates to deployment of dedicated shed drivers and parking officers. Indec acknowledges that the operator of the four largest regions operates with a number of very congested depots which historically has led to the provision of shed drivers and parking officers.

2.3. Stage 3 – Transition to a more Efficient Cost Structure

In consultation with of the operator of the four largest regions, Indec has identified a range of potential savings initiatives which provide scope for improving this operators’ cost efficiency over the short, medium and long term. The savings initiatives have been considered within the bus operator’s existing technological, managerial and Government policy constraints on moving toward efficiency. It should be noted that it is not Indec’s intention to prescribe what savings are to be implemented in specific areas. The initiatives listed here should be viewed as indicative. Specifically, Indec acknowledges the bus operator’s absolute discretion in deciding the exact nature of savings initiatives and the manner and timing of implementation. Indec’s experience in these matters is that during implementation of productivity measures, outcomes can be uncertain and sometimes savings will not be achieved in some target areas but may materialise in other sections and cost categories.

The list of cost saving measures below is based on robust estimates that indicate that the potential annual cost saving associated with these measures by 2013/14 totals $41.77 million. The transition path incorporating this suite of tangible measures that are capable of being gradually implemented may enable the operator of the four largest regions to move from its present cost structure towards a more efficient cost structure over the medium term (five years). The impact of the stage 1 and 2 adjustments and the savings transition path are illustrated in table 2.3.1.
Table 2.3.1 Indec Recommended Operating Expenditure for Regions 6, 7, 8 and 9 ($ million real 2009/10)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indec Recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient OPEX Benchmark</td>
<td>365.30</td>
<td>375.62</td>
<td>383.03</td>
<td>388.61</td>
<td>394.57</td>
<td>400.66</td>
</tr>
<tr>
<td>Costs associated with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>operating region 6-9</td>
<td>65.67</td>
<td>67.93</td>
<td>68.58</td>
<td>69.26</td>
<td>69.94</td>
<td>70.64</td>
</tr>
<tr>
<td>Inefficiencies</td>
<td>47.54</td>
<td>49.71</td>
<td>50.61</td>
<td>51.53</td>
<td>52.47</td>
<td>53.43</td>
</tr>
<tr>
<td>Indec Recommended</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient Cost</td>
<td>430.97</td>
<td>443.75</td>
<td>451.61</td>
<td>457.87</td>
<td>464.51</td>
<td>471.29</td>
</tr>
<tr>
<td>Transition to Indec</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Efficient Cost</td>
<td>478.51</td>
<td>493.21</td>
<td>492.42</td>
<td>491.01</td>
<td>488.13</td>
<td>482.95</td>
</tr>
</tbody>
</table>

Note: Columns/rows may not add due to rounding

Indec also wishes to acknowledge that the majority of the savings initiatives listed here had already been identified by the operator of the four largest regions and that some initiatives are already part of an established program. Potential savings and productivity measures and initiatives include:

► reviewing Work As Directed arrangements (WAD);
► reviewing return to work conditions during shifts;
► reviewing resource requirements for bus movements in depots;
► reviewing of security, restructuring static security with CCTV;
► improving network scheduling efficiencies;
► further reducing absenteeism;
► implementing faster running times through prepaid ticketing initiatives;
► reducing on-bus injuries through changed driver behaviour; and
► securing productivity improvements to off-set real wage rate increases.

The foregoing analysis has been summarised in figure 2.3.2 which illustrates the impact of the savings initiatives and transition path on the operator of the four largest regions operating expense. Both table 2.3.1 and figure 2.3.2 also show that by 2013/14 the gap between the Indec recommended efficient operating expense and the bus operator’s costs would be closed to within $11.7 million. This result is subject to full implementation of the recommended savings and transition path.
Figure 2.3.2 Efficient Operating Expense Scenarios for Regions 6, 7, 8 and 9 ($ million real 2009/10)
3. EFFICIENT CAPITAL EXPENSE (CAPEX)

The operator of the four largest regions projects total capital expense to peak at $176.4 million in 2009/10 and $148.3 million in 2010/11. Beyond 2010/11, capital expenditure is expected to stabilise at $87.45 million in 2011/12 and further decline to around $78.9 million in 2013/14 (figure 3.1). All CAPEX amounts are expressed in real 2009/10 dollars.

![Figure 3.1 Regions 6, 7, 8, and 9 Historical and Projected Capital Expenditure (CAPEX $ million real 2009/10)](image)

The operator of the four largest regions projects that expenditure on buildings and improvements will peak in the current budget year at $40.2 million including new depot at Tempe ($10.2 million) and other building improvements and works. It is investing in additional depot capacity as current depots are critically constrained to accommodate the planned expansion of the fleet by 89 additional vehicles.

Significant capital expenditures of $21.6 million and $10.8 million were incurred on plant and equipment in 2007/08 and 2008/09 respectively. The operator of the four largest regions forecasts that expenditure in this category will be $18.9 million in 2009/10 and $10.5 million in 2010/11. It also expects expenditure on plant and equipment to gradually decline to an average expenditure of $5.5 million during the period from 2011/12 to 2013/14.

The majority of capital expenditure, however, is expected to be directed to the acquisition of new buses to cover both fleet replacement and patronage growth. The fleet in the four largest regions is forecast to increase by 98 vehicles from 1,879 buses in 2008/09 to 1,977 buses in 2013/14 (figure 3.2). During the same period, the number of spare buses in the four largest regions is expected to decline from 194 buses or 10.3% of the fleet in 2008/09 to 147 buses or 7.4% of the fleet in 2013/14.
Expenditure on new bus fleet is projected to consist of both replacement vehicles and buses to cover anticipated growth in patronage. 561 buses or 85% of new fleet purchases are earmarked for replacing existing fleet and the balance of 98 vehicles or 14.9% of new purchases for growth. A significant proportion of replacement vehicles (58.7%) will be articulated buses which have a greater carrying capacity than standard buses.

![Figure 3.2 Historical and Projected Bus Fleet](image)

Indec’s analysis of total fleet capacity in the forward years is that the fleet was expected to grow by 5.22 per cent. However, due to the increasing proportion of articulated buses in the fleet, seating capacity is expected to increase by 10.96 per cent or by 9,283 seats from 84,692 seats in 2008/09 to 93,975 in 2013/14. As a consequence, seating capacity will increase from 45.07 per bus in 2008/09 to 47.53 seats per bus in 2013/14. Standing room is forecast to remain relatively static with only slight contraction from 22.32 in 2008/09 to 21.21 persons per bus in 2013/14. Total maximum capacity is therefore projected to increase by 9,277 or 7.33% from 126,627 in 2008/09 to 135,904 persons in 2013/14 and from 67.39 to 68.74 persons per bus. The increase in capacity equates to a compound capacity growth rate of approximately 1.43% per annum in the five years between 2008/09 to 2013/14.

The operator of the four largest regions expects that capital expenditure on new fleet will peak in 2009/10 and 2010/11 at $117.3 million and $113.4 million respectively and then stabilise at $69.3 million per annum during the period from 2011/12 to 2013/14.

---

3 Known as ‘Crush capacity’ is defined here as full utilisation of the average total seating and standing capacity per bus
4 Ibid.
Indec is not in a position to comment on the efficiency of the operator of the four largest regions’ capital expenditure program. The efficiency of the program can only be assessed on the basis of fleet and facility utilisation. Indec normally relies on load factors of buses during the peak to assess the efficiency of fleet disposition and deployment. A great deal of time was spent on site in an attempt to locate suitable data for the calculation of capital efficiency. Indec concludes from those attempts that the operator does not maintain passenger loading statistics by time of day and was therefore unable to establish capital efficiency. Indec strongly recommends that all bus operators collect such statistics in future to assist with assessing relative efficiency of capital expenditure. Collecting such statistics would also assist with future business case development for fleet replacement and augmentation strategies, network planning and optimisation, and resource allocation (fleet, infrastructure, staffing and financial resources).
4. **BENCHMARKING**

Indec undertook benchmarking to determine the costs of a hypothetical efficient bus operator. Indec carried out extensive and detailed benchmarking comparisons of regions 6, 7, 8 and 9 with the following comparator operators. All survey data was scrutinised for data integrity and correctness. Ratio and calculated unit cost analysis was the key tool used for critical scrutiny of all data and information.

The aim of critical data review and scrutiny was to explain any major ratio and unit cost variations and to provide a basis for seeking clarification from the data sources. The majority of data queries could either be explained by differences in operating environment, assets and resources or led to corrections of reported data. The following data was used an input into our analysis:

- The existing benchmarking data base resources of Indec and Ian Wallis & Associates.
- Cost and operational data for the eleven other Sydney metropolitan regions.
- Some high level headline unit costs covering a number of the larger Sydney metropolitan regional operators provided by Bus NSW.
- Interstate private metropolitan bus operators in Melbourne, Perth and Adelaide.
- Interstate public operators in Brisbane, Canberra and Hobart.
- International benchmarking survey⁵ data collected by the International Bus Benchmarking Group⁶ that the operator of the four largest regions participates in, covering Barcelona, Brussels, Dublin, Lisbon, London, Madrid, Montreal, New York, Paris, Sydney and Vancouver.

The analysis of the fifteen Sydney metropolitan regions took considerable time. NSWTI provided a range of information including the following data:

- the 2005/06 bid templates for the 15 Sydney metropolitan regions; and
- data submitted by operators to NSWTI under the requirements of the new metropolitan bus service contracts (MBSCs). Data covers the period from 2005/06 to the first quarter of 2008/09.

The reported information made available to Indec consisted of:

- monthly MBSC returns detailing kilometres, patronage, farebox, performance data, missed or cancelled services, customer feedback and timetable information;

---

⁵ Provided on an anonymous basis
⁶ The Imperial College, London
quarterly reports detailing fleet details, revenue protection and patronage (incomplete); and

yearly business plans for each region.

Indec has taken great care to cross reference and calibrate all data to achieve a valid and consistent benchmarking outcome. For instance, the 2005/06 Sydney metropolitan bid template data was indexed to 2008/09 and cross reference checked with appropriately indexed reported information from the monthly, quarterly and yearly operator returns and existing Indec data base information. This due diligence was particularly important as the monthly and quarterly Sydney metropolitan operator returns do not contain material that is suitable for efficient cost or benchmarking reviews. The business plans lodged by the some private Sydney metropolitan regions do contain some useful information, albeit of inconsistent format and wide variations in quality.

In addition, governments in some jurisdictions where bus services have been tendered and outsourced incur in-house expenses often borne by bus operators elsewhere. Examples range from expenses on call centres, security, facility costs, time tabling and ticketing expense, bus insurance, registration and ticket sales commissions, etc. All collected information has been scrutinised and adjustments have been made to ensure a comparison on an equal basis was possible.

Having extensively analysed the bid templates and the MBSC returns and reports Indec concludes that:

- although some data ranges were missing from the templates, the 2005/06 bid templates were a reliable source of data;

- MBSC monthly and quarterly returns do not contain sufficient data to monitor operating characteristics such as bus hours, dead running and speed, and are often incomplete;

- business plans are of inconsistent format and operational and cost data appears unreliable and often incomplete;

- In summary, the MBSC returns were not a reliable source of data and only limited analysis was possible and only then because other information was available to enable corrections and augmentations to be made.

Although recommendations with respect to MBSC operator returns are not an integral part of the scope of this review, the state of the returns may warrant some constructive observations. It is Indec’s contention that the discipline of thorough and regular reporting would benefit both the NSWTI and the contract regions. Benefits that may accrue to both parties from a more vigilant approach to reporting would potentially assist with performance monitoring and benchmarking,
contract management and administration, and contract renewal negotiations. Specifically, a more robust and vigilant reporting approach may include, without limitation:

- incorporation in the standard reporting MBSC template of some minimum operating data currently entirely absent from the reporting requirements under the MBSCs (i.e. in-service and total bus hours, etc);
- a standard format and template business plans;
- regular and timely review of reported/submitted data for accuracy and completeness incorporating standard ratio analysis to identify data integrity problems and missing information;
- regular and timely follow-up to seek data and information clarification where required;
- regular and timely notification of reporting breaches of the MBSC reporting requirements including addressing repeated incidences of missing or inaccurate data.

- Introduce penalties for repeated breaches of contract in terms of MBSC reporting requirements.

Figure 4.1 contains indicative aggregate unit operating cost comparisons of the operator of the four largest regions and metropolitan bus operators from seven Australian jurisdictions. The seven comparators include private operators in Sydney, Melbourne, Perth and Adelaide, and public bus operators in Hobart, Brisbane and Canberra.

An international benchmark based on data has also been inserted for comparison (INT). Indec has used the relative performance of the operator of the four largest regions to construct the comparison. Indec was advised that the relative performance information was drawn from data collected by the International Bus Benchmarking Group and that the data was normalised using the Purchasing Power Parity (PPP) index. Members of the group include Barcelona, Brussels, Dublin, Lisbon, London, Madrid, Montreal, New York, Paris, Sydney and Vancouver. It should be noted that not all cities are included in every performance comparison. Indec has adjusted the data provided for the operator of the four largest regions’ speed and fuel costs. Note that some of the differences between the operator of the four largest regions and international operators may be due to differences in service quality, network, infrastructure and modal integration, patronage density, congestion, environmental standards and other regulatory factors. Care needs therefore be taken in interpreting and drawing any conclusions from the weighted average presented in the following charts.

---

7 ibid.
The indicative summary chart in figure 4.1 shows total bus operating unit cost index comparisons adjusted for speed and fuel costs of the operator of the four largest regions. In 2008/09 total bus operating unit cost for the operator of the four largest regions was 14.3% above the total bus operating unit costs of other Australian public metropolitan bus operators (ACT, TAS, and QLD).

![Figure 4.1 Indicative Aggregate OPEX index comparisons](image1)

**Figure 4.1 Indicative Aggregate OPEX index comparisons**

The three cost components of the analysis contained in figure 4.1 have been further examined individually. The results of that analysis are illustrated in the following figures 4.2 to 4.4.

The indicative summary chart in figure 4.2 shows bus hourly unit cost index per bus kilometre comparisons adjusted for speed and fuel costs of the operator of the four largest regions. In 2008/09 the bus hour unit cost for the operator of the four largest regions was 4.5% above the average bus hour unit cost of other Australian public metropolitan bus operators (ACT, TAS, and QLD).

![Figure 4.2 Indicative Bus Hourly Cost Index Comparisons](image2)
The indicative summary chart in figure 4.3 shows bus kilometre unit cost index comparisons adjusted for speed and fuel costs of the operator of the four largest regions. In 2008/09 the public bus kilometre unit cost for the operator of the four largest regions was 6.3% above the average bus kilometre unit cost of other Australian public metropolitan bus operators (ACT, TAS, and QLD).

![Figure 4.3 Indicative Bus Kilometre Unit Cost Index Comparisons](image1)

The indicative summary chart in figure 4.4 shows bus overhead unit cost index comparisons adjusted for speed and fuel costs of the operator of the four largest regions.

![Figure 4.4 Indicative Bus Overhead Unit Cost Index Comparisons](image2)

In 2008/09 the public bus overhead unit cost of the operator of the four largest regions was 24.4% above the average bus overhead unit cost of other Australian public metropolitan bus operators (ACT, TAS, and QLD).
5. SCHOOL TRAVEL

The operator of the four largest regions has provided estimates of the number of school children on scheduled route services but such estimates are subject to certain limitations. The current and projected boardings including SSTS travel on both scheduled and dedicated school services are summarised by patronage category in table 5.1.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled Route Services Boardings</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adult</td>
<td>100.3</td>
<td>101.8</td>
<td>103.3</td>
<td>104.9</td>
<td>106.4</td>
<td>108.0</td>
</tr>
<tr>
<td>Concession - Adult</td>
<td>28.7</td>
<td>29.1</td>
<td>29.1</td>
<td>29.1</td>
<td>29.1</td>
<td>29.1</td>
</tr>
<tr>
<td>PET</td>
<td>26.2</td>
<td>26.6</td>
<td>26.6</td>
<td>26.6</td>
<td>26.6</td>
<td>26.6</td>
</tr>
<tr>
<td>Students</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>School Children (SSTS)</td>
<td>7.1</td>
<td>7.2</td>
<td>7.2</td>
<td>7.2</td>
<td>7.2</td>
<td>7.2</td>
</tr>
<tr>
<td>Total Scheduled Route Boardings</td>
<td>162.3</td>
<td>164.8</td>
<td>166.3</td>
<td>167.8</td>
<td>169.4</td>
<td>171.0</td>
</tr>
</tbody>
</table>

SSTS share of Boardings                  | 4.39%   | 4.39%   | 4.35%   | 4.31%   | 4.27%   | 4.23%   |

Dedicated School Services Boardings     |         |         |         |         |         |         |
| School Children Boardings (SSTS)       | 4.1     | 4.1     | 4.2     | 4.3     | 4.3     | 4.4     |
| Total Boardings                        | 166.4   | 168.9   | 170.5   | 172.1   | 173.7   | 175.4   |

Table 5.1 Actual and Projected Boardings for Regions 6, 7, 8 and 9

The analysis undertaken indicates that in 2008/09 the relative share of SSTS boardings as a proportion of total boardings on scheduled route services was approximately 4.39 per cent. Patronage projections are based on the assumption that boardings will increases by 1.5% per annum beyond 2009/10. Of interest is that whilst total boardings are projected to increase by 1.5% per annum from 166.4 in 2008/09 to 175.4 million in 2013/14, the share of SSTS travel on scheduled route services is expected to contract.

The actual 2008/09 and projected boardings to 2013/14 for regions 6, 7, 8 and 9 were summarised in table 5.1.

School travel accounted for approximately 4.39 per cent of total scheduled route services boardings in 2008/09. That proportion of 4.39% has been applied to the efficient total operating expense of scheduled route services. The analysis undertaken illustrates that efficient average unit cost for school travel in 2008/09 was around $2.52 per boarding on scheduled route services and $4.41 on dedicated school services (OPEX only). The efficient operating expense of dedicated school services has been calculated on the basis of extending dedicated school services bus hours and kilometres by the appropriate efficient unit costs (bus hourly and overhead, and bus kilometre unit costs respectively).

To derive the efficient cost per boarding for school travel on scheduled route services, the total efficient operating expense for that service category was divided by 4.39% of the total boardings. Similarly, the total efficient operating expense for school travel on dedicated school services was
divided by the total boardings for that service category to derive the efficient cost per boarding. The combined efficient SSTS operating expense per boarding is a weighted average which accounts for all travel on dedicated school services and the proportion of school travel on scheduled route services.

The overall average efficient cost per SSTS boarding is approximately 10% below the operator of the four largest regions’ unit costs.
6. **MARGINAL COST ANALYSIS**

6.1. **Fixed and Variable Costs**

The definition of fixed and variable costs used for the purpose of this report is consistent with the approach incorporated in the 2004/05 Metropolitan Bus Services Contract bid template which included a "summary of cash flows with the state" spreadsheet. This spreadsheet is a standard form used for all MBSC bid templates and sets out from a cash flow perspective which values are fixed costs and variable costs.

By standard definition, fixed costs of a business are costs that are not dependent on the activities of the business and conversely, variable costs are costs that change in proportion to the activities of a business. Indec has defined the following costs as fixed:

- bus overhead costs less selected variable overhead costs detailed below;
- existing depot lease costs;
- depreciation on existing fleet; and
- depreciation on existing owned depots;

Indec has defined the following costs as variable:

- variable bus overhead cost including bus registration & CTP insurance, cash collection and ticketing;
- bus hourly costs (driver costs);
- bus kilometre costs; and
- payments for new Fleet.

The categorisation of overhead costs as fixed should not lead to the assumptions that overhead costs could not change in a severe decline or significant upswing in business activity. Ultimately all costs can be changed to respond to changes in the level of business. Overhead costs should be viewed as ‘relatively’ fixed under normal business continuity conditions.

Indec’s analysis shows that the ratio of fixed to variable costs changes little during the forecast period from the average of 25.8 % to 74.2 % or a ratio of approximately one to three. The analysis illustrates that the efficient benchmark operator’s fixed costs are low relative to its total costs when compared to the operator of the four largest regions.
6.2. Marginal Cost of Patronage Growth

IPART asked Indec to provide:

- an estimate of the efficient marginal cost of one extra passenger;
- an estimate of the efficient change in costs when there is a 5% increase in passengers; and
- the marginal cost per extra passenger kilometre.

Separate estimates of each of these costs had to be provided for:

- peak and off peak times;
- circumstances where there is spare capacity on bus services;
- circumstances where buses are full to capacity; and
- for discretionary and non discretionary travel.

Indec’s typical approach to marginal costing normally relies on load factors of buses during the peak. However the operator of the four largest regions does not maintain passenger loading statistics by time of day. Indec strongly recommends that all bus operators collect such statistics in future to assist with business case development for fleet replacement and augmentation strategies, network planning and optimisation, and resource allocation (fleet, infrastructure, staffing and financial resources).

Given that passenger loading data is unavailable, the fall-back methodology used for the purpose of this review is based on a number of simplifying assumptions and approximations:

- the existing fleet is at capacity during at least one daily peak in either the up or down direction;
- bus seating/standing capacity data provided by the operator is an accurate estimate;
- maximum or ‘crush’ capacity is reached when stated seating/standing capacity has been filled;
- the hypothetical step change increase in patronage of 5% is uniformly distributed; and
- the average annual kilometers and hours per bus would equally apply to any new fleet.

Indec has examined the historical and projected seating and standing capacity of the operator of the four largest regions’ fleet and the results are summarised in table 6.2.1. The analysis incorporates planned fleet acquisitions and the associated changes to passenger carrying capacity. Current fleet acquisition plans envisage total fleet acquisitions of 659 vehicles, 150 of
which will be articulated buses. The operator of the four largest regions has also planned for 561 disposals of existing fleet.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total Seating &amp; Standing Capacity</th>
<th>Average Capacity per Bus</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008/09</td>
<td>126,627</td>
<td>67.39</td>
</tr>
<tr>
<td>2009/10</td>
<td>126,771</td>
<td>66.79</td>
</tr>
<tr>
<td>2010/11</td>
<td>128,842</td>
<td>67.21</td>
</tr>
<tr>
<td>2011/12</td>
<td>131,196</td>
<td>67.73</td>
</tr>
<tr>
<td>2012/13</td>
<td>133,550</td>
<td>68.24</td>
</tr>
<tr>
<td>2013/14</td>
<td>135,904</td>
<td>68.74</td>
</tr>
</tbody>
</table>

Table 6.2.1 Projected Passenger Carrying Capacity for Regions 6, 7, 8 and 9

Indec concludes that 561 new buses are earmarked for replacing existing fleet and 98 new buses are provided to cover patronage growth. However, some replacement buses will provide more capacity than the replaced fleet. Total passenger capacity is projected to expand from 126,627 ‘places’ in 2008/09 to 135,904 in 2013/14, an increase of approximately 7.33 per cent or an annual compound growth rate of 1.014% (table 6.2.1). The increase of total capacity is entirely related to an increase in seating capacity, standing capacity is forecast to decline slightly over the period from 41,935 places in 2008/09 to 41,929 in 2013/14. The average capacity per bus increases over the period from 66.79 places in 2009/10 to 68.74 in 2013/14.

**Step 1**

In step 1 the additional fleet requirement and the additional annual bus kilometres and hours associated with operating the additional buses have been quantified (including spares).

The operator of the four largest regions expects its Sydney metropolitan fleet size to marginally increase by 19 buses from 1,888 vehicles in 2008/09 to 1,898 in 2009/10. It also predicts that total fleet seating/standing capacity will increase by 144 places from 126,627 places in 2008/09 to 126,771 in 2009/10. It also expects that the average seating/standing capacity per bus will also slightly increase from 67.4 in 2008/09 to 66.8 places in 2009/10. The operator's patronage projection for 2009/10 is 166.39 million, an increase of 2.50 million places from the 2008/09 level.

Annual passengers or boardings per bus are calculated by dividing the total patronage by the actual or projected total fleet seating/standing capacity for a particular year. The results of this calculation based on the operator of the four largest regions reported and forecast data is that there were 1,314 annual passengers or boardings per place in 2008/09 and that it expects there will be 1,322 boardings per place in 2009/10. The operator of the four largest regions projected that vehicle and bus kilometres would also increase by 1.5 million kilometres from 62.14 million kilometres in 2008/09 to 63.30 million kilometres in 2009/10. There were 2.05 passenger boardings per kilometre and that this statistic does not materially change in 2009/10.
The additional fleet requirement and annual bus kilometres and hours associated with operating the additional buses have been quantified (including spares). The bus operator’s fleet requirements and increase to meet a step increase in patronage of 5% in 2008/09 and 2009/10 and the resultant change in boardings per kilometre were calculated. In each year the patronage increase of 5% has been applied to the operators’ existing patronage and forecast patronage. The revised number of total fleet seating/standing places required for a 5% step increase has been calculated based on the assumption that the number of annual passengers per place would not change (1,314 and 1,332 per annum in 2008/09 and 2009/10 respectively).

**Step 2**

In step 2, the marginal cost of operating the additional fleet to meet a 5% patronage increase has been assessed.

The ‘fixed’ cost as defined in section 6 contains bus fleet lease costs, interest and depreciation expense of the existing fleet. However, for the purpose of calculating the marginal cost, the marginal capital cost has to also be established. All variable costs have been estimated by applying the appropriate efficient unit cost rates to annual bus kilometres and hours assessed in step 1. The total marginal cost of operating the new fleet is approximately $10.6 million excluding and $14.8 million including capital expense. All amounts are expressed in real 2009/10 dollars.

**Step 3**

In step 3 the marginal unit costs are estimated and the relevant calculations and results of step 3 are summarised in table 6.2.2. The total annual cost established in step 2 is divided by the marginal increase in patronage arising from the hypothetical 5% growth scenario (8.4 million boardings). This calculation results in a marginal cost per passenger (boarding) of $1.26 excluding capital expense on the new buses and $1.76 including capital.

The marginal cost per passenger kilometre has been estimated dividing the marginal cost per passenger by the estimated average trip length in 2009/10 for regions 6, 7, 8 and 9. The resulting cost per passenger kilometre is 22.93 cents per passenger kilometre excluding capital expense on new fleet and 31.95 cents including capital.
<table>
<thead>
<tr>
<th>Cost Category</th>
<th>2009/10 Marginal Cost excl Capital</th>
<th>2009/10 Marginal Cost incl Capital</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patronage increase (%)</td>
<td>5.00</td>
<td>5.00</td>
</tr>
<tr>
<td>Patronage increase ($ million)</td>
<td>8.44</td>
<td>8.44</td>
</tr>
<tr>
<td>Marginal Cost per Passenger ($)</td>
<td>1.26</td>
<td>1.76</td>
</tr>
<tr>
<td>Average Trip Length (Kilometres)†</td>
<td>5.50</td>
<td>5.50</td>
</tr>
<tr>
<td>Cost per Passenger Kilometre (¢)</td>
<td>22.93</td>
<td>31.95</td>
</tr>
</tbody>
</table>

Notes: Columns/rows may not total due to rounding. Estimate for regions 6, 7, 8 and 9.

Table 6.2.2 Calculation of Efficient Marginal Cost per Passenger Kilometre for New Fleet Regions 6, 7, 8 and 9 (Real 2009/10cents)

It should be noted that this ‘fall-back’ methodology does not adequately account for the passenger loadings during the peak and does not account for any spare capacity in the existing/projected 2009/10 fleet on some peak services. However, the results of this analysis should give a reasonable indication of the marginal costs associated with a 5% growth in demand.