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Efficient costs of rural and regional bus operators

Final Report

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Executive Summary

Rural and regional bus operators are paid by the NSW Government via Transport for NSW (TfNSW) under recently revised service contracts that generally commenced on either 1 April or 1 June 2016.

The NSW Government asked IPART to determine the appropriate maximum fares that can be charged by rural and regional bus operators for passenger services, excluding school student services, from 1 January 2018. In making a determination or recommendation on fare levels, IPART is required to consider the cost of providing the services; opportunities to increase the efficiency of service delivery; standards of quality, reliability and safety; and the effect of its determination or recommendation on the level of Government funding involved.

In order to assist it satisfy its Terms of Reference, IPART awarded AECOM a study expected to determine the efficient and marginal costs of providing rural and regional bus services. This document reports the findings and conclusions of that study.

The study involved a comprehensive bottom-up analysis of bus running costs for measured route distances in order to determine reliable unit and marginal costs. The application of **unit costs** is complex for services such as these, because they involve some cost types that are directly related to distance travelled or time incurred, and some that are fixed annual costs that must be divided by distance travelled to derive unit costs per km.

Unit costs for representative bus models in each of the four bus Categories used by TfNSW are presented in Figure 1, based on the average reported annual distance travelled by buses in the Category (generally around 30,000 km per year), and on the average number of seats. Figure 1 shows the relative significance of the cost type for each Category of bus, and the change in unit costs between bus Categories. The most significant cost for the typical bus is the driver, but capital costs and overhead recovery become more significant with a larger bus. Maintenance costs are a minor contributor to total unit costs. It should be noted that this fleet is relatively lightly used when compared to urban buses, so fixed costs would be expected to be more significant in unit costs for this fleet.

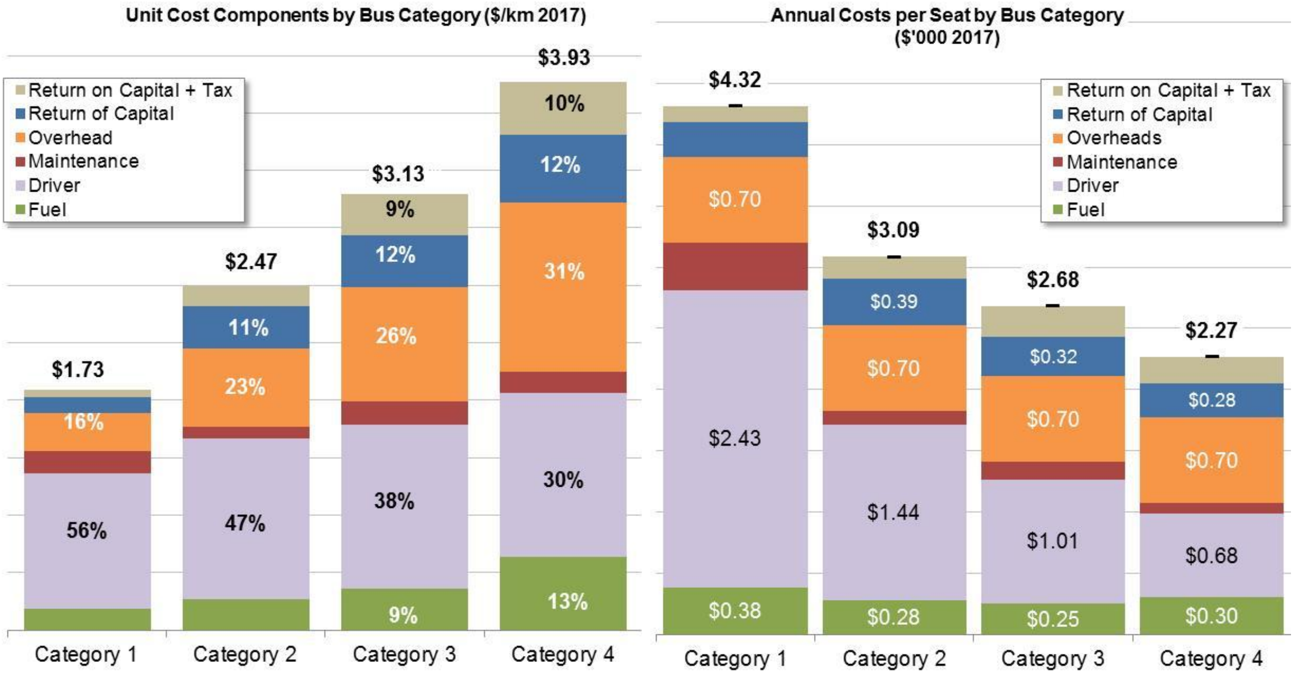

Figure 1 Summary of unit costs per km and seat, by TfNSW bus category

These unit costs have been applied to the bus Category operating each route to derive the efficient cost of operating the route, using distance (including deadruns) and driving times that have themselves been reviewed and in some cases adjusted based on our evaluation of the route, and the number of scheduled trips. Where reported patronage suggests that a change in bus Category would be more efficient for a specific route, we have made that change to derive efficient costs for the route.

These bus services were categorised into ‘A’ contracts, including operators that only have school routes, and ‘B’ contracts, including operators that have regular (town or regional) routes and who may also have school routes[1]. This reflects the historical delineation of contracts and data categorisation. The derived efficient cost for operating each ‘A’ contract route compares well *on average* with current contract costs, but less well for ‘B’ contracts, for three main reasons:

- There may be differences between our estimated route lengths and driving time and those reported by the operator (and used as the basis for their contract);
- Operators of ‘B’ routes may be using a large bus where a lower Category bus would be able to provide the service required at a lower cost;
- Operator’s overhead structures may be significantly different from the mean for the group.

There are outliers where the current contract value is significantly different from the estimated efficient cost. We recommend that these be investigated with a view to revising the contract where possible.

Marginal costs may be expressed on a *per km* and a *per passenger* basis. In practice, however, there are no marginal costs per passenger until a change in bus Category is required (or an additional bus is needed), so it is more relevant to consider a marginal cost *per seat*. The number of passengers (patronage) carried by a bus affects revenue (cost recovery) – it has no measurable effect on costs unless a change in bus size is required. We refer to the proportion of seats occupied as utilisation.

Marginal costs are presented on a *per km* and a *per seat* basis in Figure 2, indicating how these costs change according to annual distance travelled (the fixed costs reduce on a per km basis as distance travelled increases).

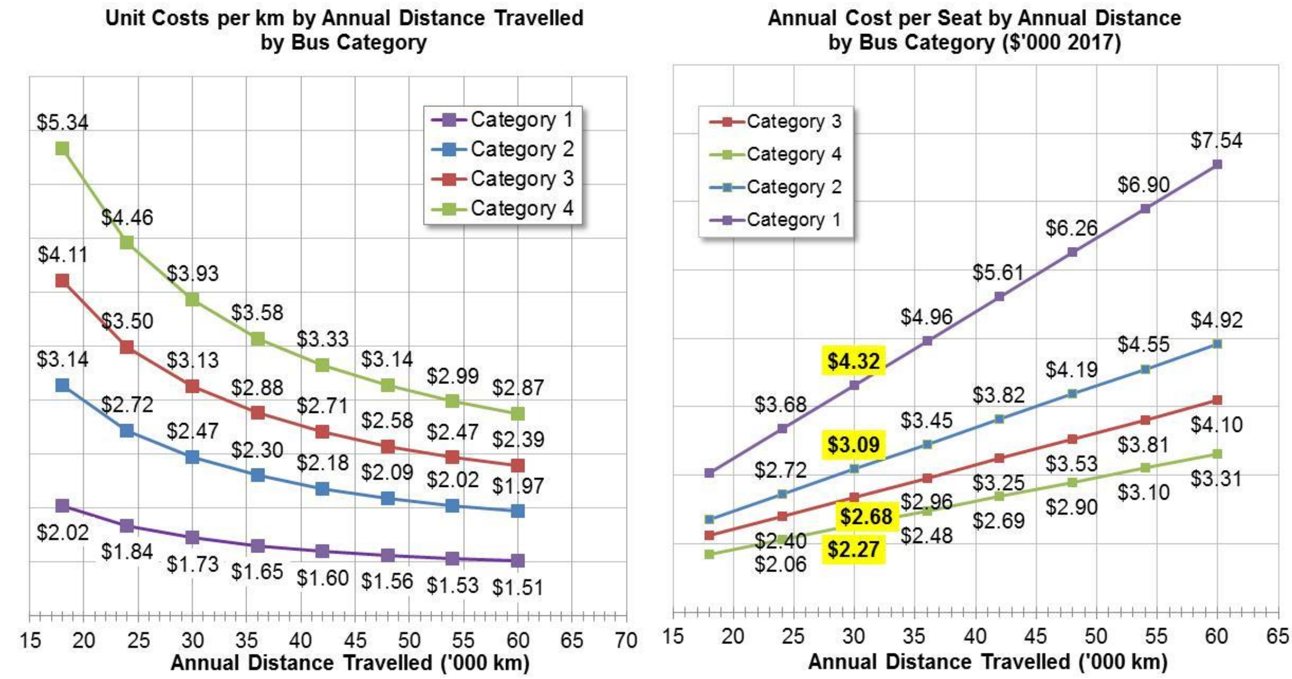

Figure 2 Marginal costs per km and per seat

[1] Noting also that school students may also travel of regular route services

Reported patronage data indicates that *school* routes show reasonable levels of bus utilisation, but average bus utilisation for *regular* (town) routes is only 12% (a frequency distribution of seat utilisation for regular (town) routes is shown in Figure 3).[2]

For a majority of regular routes, a step down of bus Categories would provide a more efficient service (allowing for peak demand).

If all opportunities to downsize were taken, the total cost of regular services could reduce by up to 21% (if 'B' contract buses are used for both school and regular routes, there may not be an opportunity to downsize).

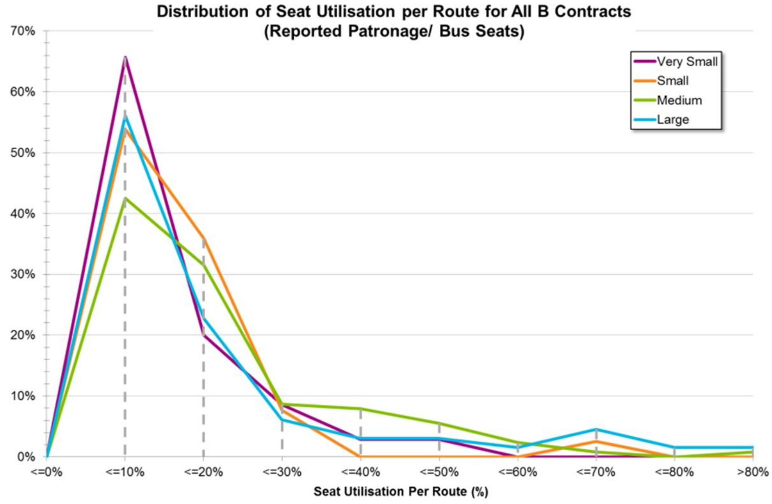

Figure 3 Reported seat utilisation across 'B' Contracts (where data available)

We have made a number of observations and recommendations:

- This review did not identify a strong rationale for managing bus contracts by fleet size or for categorising buses by the number of seats, as is current practice. There is enough overlap between bus Categories 3 and 4 (defined by the number of seats) to make the distinction effectively immaterial, and although we have used the Categories as they stand, we recommend that categorisation based on bus configuration be adopted instead.
- We found that the previous 'A' and 'B' contract types were more useful for our purposes than the categorisation by size of fleet, since they represent different types of service provided. We recommend that a structure based on the nature of the service provided be considered for contract management.
- The current medium and large contracts include an obligation for operators to identify opportunities for increased efficiency or effectiveness in delivering the service, but there seems little incentive for them to do so. More flexibility in allocation of bus model to route would be beneficial, especially for the 'B' contracts, and we recommend that policy and contractual options be explored to improve efficiency in this area.
- The quality of data available on current service performance is relatively poor, and considerable effort was required during this review to establish accurate route characteristics and to identify buses actually used on routes in order to estimate seat capacity and therefore bus utilisation.

  We recommend that TfNSW clearly articulate the specific requirements for the reporting, with specific reference to definition of the cost items that are to be included within each of the current headings in Schedule 3 Annexure 1 of the operator contracts, to improve the consistency, quality and value of the data collected. This would provide TfNSW staff with higher quality data with which to manage its rural and regional bus service delivery program.
- This review has noted outliers among operators who appear to have significantly higher cost structures than their peers, and we recommend that TfNSW review these contracts to address the differences.
- We have noted that TfNSW's maximum vehicle age rule may impose unnecessary costs on rural and regional bus services, and recommend that this be reviewed.

[2] Excluding school students

1.0 Introduction

Rural and regional bus operators are paid by the NSW Government via Transport for NSW (TfNSW) under service contracts. TfNSW has negotiated new contracts with existing operators which commenced on either 1 April or 1 July 2016. There are four types of new contract:

Contract Type	Fleet Size	Contract Number (starts with)
Large	More than 40 buses.	"L"
Medium	16 - 40 buses	"M"
Small	6 - 15 buses	"S"
Very Small	Less than 6 buses.	"V"

These new contracts replace previous contracts that had been classified into 'A' and 'B' series, with the 'A' series including the majority of school services, and the 'B' series covering all other town and regional services. The 'A' and 'B' classification has been retained for use in this report in order to separate school from other services.

The NSW Government asked IPART to determine the appropriate maximum fares that can be charged by rural and regional bus operators for passenger services, excluding school student services, from 1 January 2018.

In making a determination or recommendation on fare levels, IPART is required[3] to consider:

- The cost of providing the services;
- Opportunities to increase the efficiency of service delivery;
- Standards of quality, reliability and safety;
- The effect of its determination or recommendation on the level of Government funding involved.

In order to assist it satisfy its Terms of Reference, IPART issued a request for quotes for determination of the efficient costs of providing rural and regional bus services, and awarded the study to AECOM.

The study was required to estimate, for each type of contract, the efficient:

- Operating and capital costs to deliver the contracted services, and to forecast these for the 2018-2022 period;
- Marginal costs of delivering the contracted services.

The scope of works included:

- Review of previous work in this area, including the study of efficient and marginal costs of Sydney metro and outer metro services carried out in 2015 (for IPART's review of Opal fares);
- Review of current cost information from TfNSW and operational data reported by operators to TfNSW as required by the new contracts, addressing:
  - The appropriateness of the current bus fleet for the services required;
  - Causes of cost inefficiency, including the potential lack of flexible transport options;
  - Technical, managerial or policy constraints that may prevent bus operators from achieving efficient service costs;
- Estimation of the impact of cost changes from the old to the new contracts;
- Benchmarking of rural bus operators to comparable service providers elsewhere, and recommendations for efficient cost benchmarks by contract type;
- Estimation of marginal costs of providing rural and regional bus services by contract type, service planning region and time of day, and estimation of current levels of spare capacity.

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[3] Under the *Passenger Transport Act 2014*

In carrying out this study, AECOM used the information listed in Appendix A:

- Assembled fleet, route and contract data provided by TfNSW into a single set of files for use during the study.
- Identified the most common models of bus used in the rural and regional fleet in each of the bus Categories used by TfNSW, and established the range and trend of capital costs for buses in each Category.
- Developed unit costs for running representative buses in each of the TfNSW Categories, by obtaining manufacturer's recommendations, checking these with selected operators and estimating costs for all planned maintenance activities recommended by the manufacturers.
- Found that route data provided was often inaccurate or not available. Further information was obtained from TfNSW in the form of spatial data, and from the TfNSW Open Data Hub in the form of text files, and this data was used to establish the length and duration of each trip undertaken under rural and regional bus contracts, including provision for deadruns and additional driver time required.
- Assessed the cost of drivers required for each route, using estimated driving time (including deadruns or layovers) and applying typical Enterprise Agreement conditions to estimate the labour cost required by route. We also examined the impact of using the current award.
- Found that records of buses assigned to contracts and routes were inadequate, and used a variety of sources to identify the actual bus model working each route, in order to establish seat capacity available.
- Used patronage data provided by TfNSW to establish demand by route and utilisation of the seat capacity on each route.
- Assessed overhead costs among all operators and available benchmark data, established a good correlation between reported overheads (reported to TfNSW as 'Other' by operators) and seats used, and used this standardised rate to estimate the overhead required for each route.
- Applied bus unit costs to the specific parameters of each route to derive the cost of providing the service, assuming:
  - buses maintained efficiently as per manufacturer's recommendations;
  - return of and on capital based on the median of TfNSW current panel bus costs by Category, TfNSW maximum bus service life requirements and cost of capital assumptions provided by IPART;
  - derived route lengths, driving time and driver award rates as an indicator of the efficient (least) driving cost for the route;
  - manufacturer's recommendations for bus fuel usage and mean annual fuel costs;
  - overheads allocated using the mean overhead per seat used by each operator.
- Compared the derived cost by contract to contract costs as reported by TfNSW.
- Assessed the marginal cost per km travelled and per passenger for all contracts.

This report summarises the key findings during the study, and establishes what is considered an efficient cost for each route, based on a variety of stated assumptions. It also notes opportunities to improve service efficiency and indicates the potential impact on total Government costs if the stated levels of efficiency could be achieved.

An assessment has also been made of lessons learned from a variety of flexible transport pilots undertaken in Australia and around the world in an attempt to assess whether a different model of service might provide quality of service and cost of service improvements. Other opportunities for service improvement have been identified and evaluated.

2.0 Services offered by rural and regional bus operators

Rural and regional bus services are currently provided by 575 operators under 657 contracts with TfNSW, using 3,015 buses on 3,862 routes, with a total capacity of approximately 140,000 seats (Figure 4).

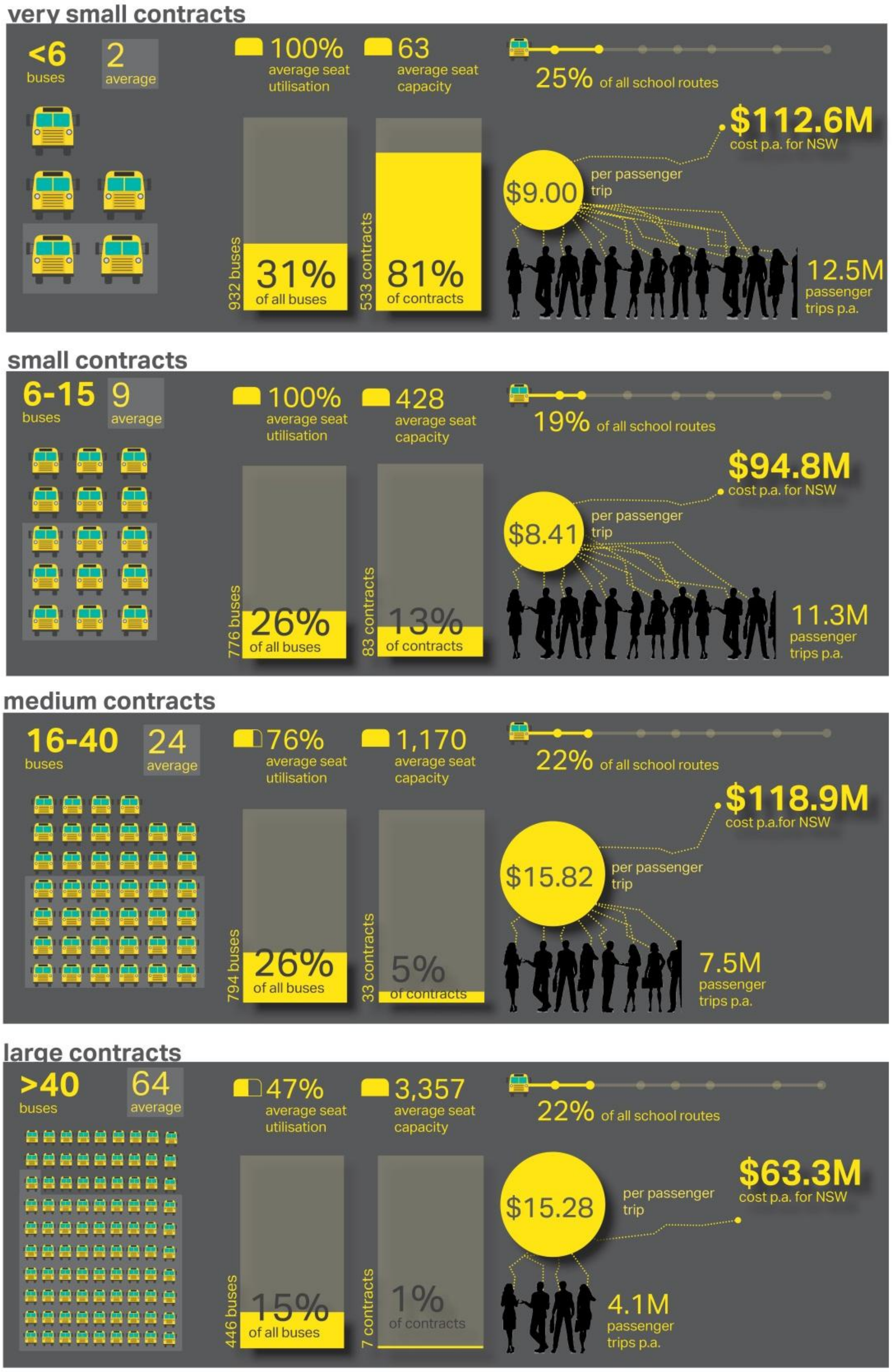

Figure 4 Infographic of the NSW Rural and Regional Bus contracts, by contract type

2.1 The Fleet

Approximately 87% of all routes are school services, 25% of which are delivered via Very Small contracts (involving 5 buses or less).

The bus fleet is drawn from a panel maintained by TfNSW, and the service contracts are subject to age restrictions that specify the maximum average age of the vehicles owned by each operator, and a maximum service life. The choice of bus models in the smaller categories has been very limited, but in the largest category (Category 4, which includes buses with 44 or more seats), 124 bus models have been used since 1992 (Figure 5). The 2017 panel provides a choice of 38 models in Category 4.

The Disability Standards for accessible transport required that 55% of all regular passenger services were operated on Disability Discrimination Act (DDA) compliant buses by 2012. Note that this standard refers to 'regular passenger services', not buses. Our understanding is that dedicated school (and other community services) are not required to comply.

The DIRD Review of the Disability Standards for Accessible Public Transport dated July 2015 referred to Transport for NSW's submission (Submission 95) which indicated that approximately 30 per cent of rural and regional services are timetabled as being wheelchair accessible.' Our review indicates that 6% of the current RRBSC fleet is categorised as low floor. We are not able to translate this into a percentage of services because specific bus models are not allocated to regular passenger services, and in practice any bus in an operator's fleet could be used on any regular service. The analysis of efficient costs is based on the most common vehicles in the fleet. For Category 4 we have selected the top 3 vehicles or the present day replacement, i.e. the Volvo B7, the Hino RG197 and the Mercedes O500 – typically configured as a DDA compliant vehicle.

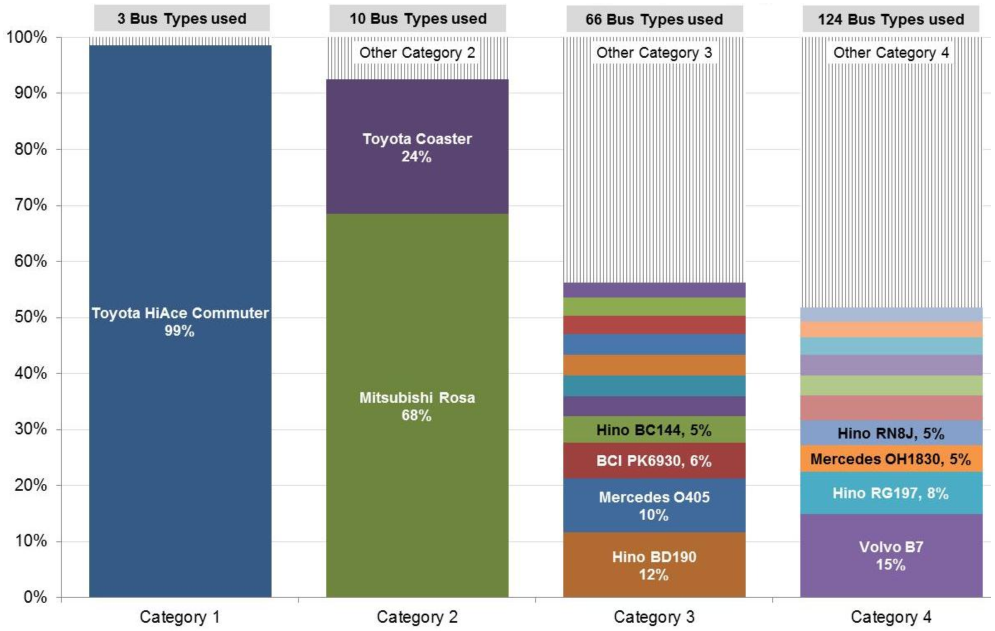

Figure 5 Bus types in each TfNSW Category

The purchase cost of the buses in the fleet is used to estimate the return of capital (depreciation) and return on capital (value of money) that should be recovered through use of each vehicle.

Historical purchase costs, indexed to current (FY2016-17) dollars, indicate relative stability in vehicle cost over the period for Categories 1 and 2, but an increasing trend in real terms for Categories 3 and 4. The data also shows significant variation from the trend (between 20% and 50%) for Categories 3 and 4.

The trend of purchase costs by bus Category over the past 15 years, in real terms, is shown in Figure 6.

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Figure 6 Bus purchase cost trends over the past 15 years

TfNSW specifies:

- The maximum age of buses operated under its contracts:
  - 15 years for Categories 1 and 2
  - 25 for Categories 3 and 4)
- The maximum average age of the fleets operated by each contract:
  - 8 years for Categories 1 and 2
  - 12 years for Categories 3 and 4.

The current age composition of the fleet is shown in Figure 7.

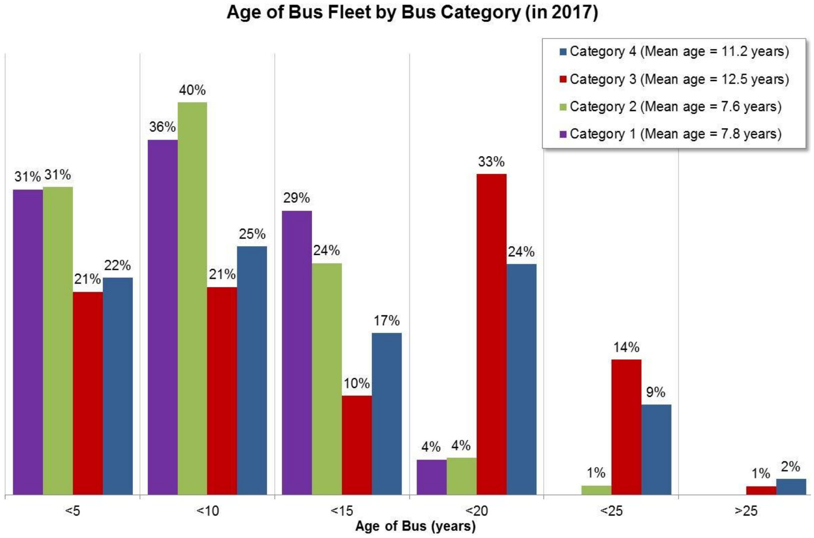


Figure 7 Age of the current fleet

3% of the fleet exceeds the TfNSW maximum age limits, and the average age of Category 3 buses is slightly higher than the maximum, but otherwise the fleet currently meets TfNSW targets.

2.2 Routes

A total of 3,862 individual routes are operated by rural and regional bus contracts in NSW, driving about 36 million passengers almost 76 million kilometres annually. The individual routes differ in length, shape, the average speed with which they are able to be covered (due to road conditions, particularly where roads are not paved), the number of stops required and other factors.

Data has been not been made available for a number of routes operated under the B Contracts, so these have been excluded from this analysis.

Some of the data presented is not sufficiently granular to identify parameters such as the number of times the routes operate and on which days. We have made reasonable assumptions in these cases, but extrapolation of the contract costs for the routes where data has been provided, indicate that the missing data could account for $69m of contract payments.

While an efficient unit cost can be determined for each bus, route characteristics affect the efficient use of the bus, and the efficient cost of delivering the service requires an adjustment to the efficient unit cost of running the bus.

The most obvious route characteristic to consider is its length. Town and regional ('B") contracts tend to have a reasonably consistent route length, but operators of 'A' (school) contracts reported much more varied route lengths (Figure 8).

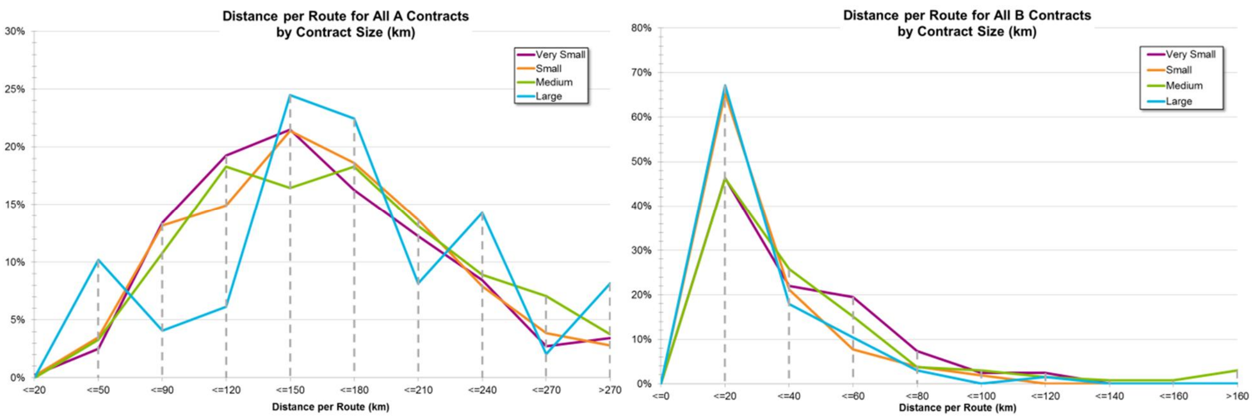


Figure 8 Distribution of route length by contract size for A and B contracts respectively

Most routes have a start and finish point that is separate from the depot or other place where the bus is stabled when not in use. The 'deadrun' trips from the depot to the start of the run and from the end of the run back to the depot, while not part of the route itself, are included in calculations of route length and route driving time. The length of the deadrun can vary considerably, and in some cases is able to be minimised or avoided by leaving the bus at the start or finish and either providing the driver with a ‘layover’ or ending that particular shift.

The data indicates that deadruns represent about 50% of the route distance for 60% of Very Small contracts, and that 50% of Small contracts tend not to have a deadrun on their routes (Figure 9). Large and Medium size contracts tend to have either a deadrun representing about 40% of the route or none at all. Those that do not have a deadrun are more likely to be town routes or loops where the start and finish of the route are in the town (and near the depot).

In a small percentage of cases, the deadrun represents almost the entirety of the route (the bus must return all the way back to the start).

The deadrun ratio and other route characteristics can have a significant impact on cost and driven time per passenger (the bus will generally be out of service during the deadrun). In an urban context, operators will minimise deadruns by moving buses from one route to another, but this option is generally not available to school and other rural contracts.

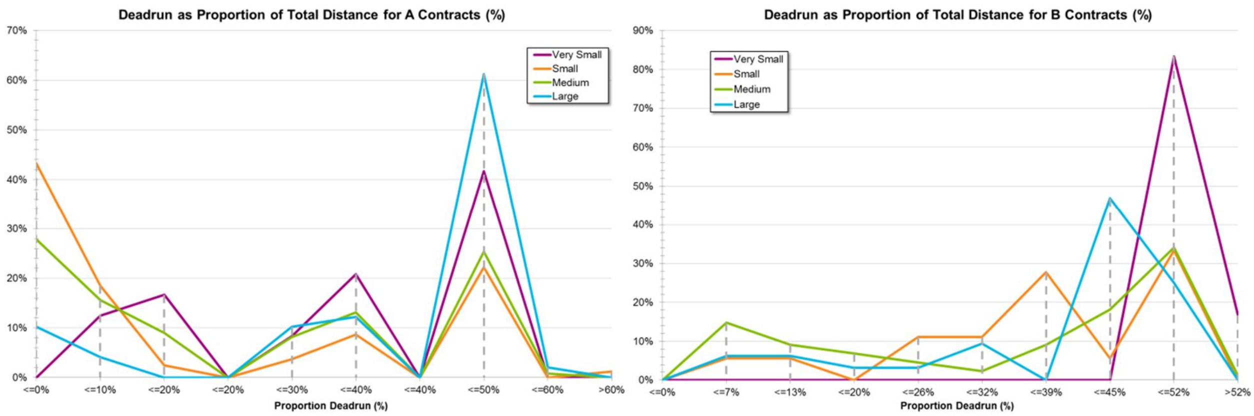


Figure 9 Deadrun distance as a percentage of reported route length for A and B contracts

Because route (including deadrun) length is a major factor in determining the cost of operating a route, the data reported by operators to TfNSW was reviewed against spatial data provided by TfNSW for school routes, and, for a proportion of the routes, the length reported by Google Maps based on the operator’s published route. Route data for non-school routes was obtained from the TfNSW Open Data hub, which also provided data on the number of trips scheduled per route.

A summary of this comparison is presented in Figure 10, which shows the difference between reported and measured route length for all routes.

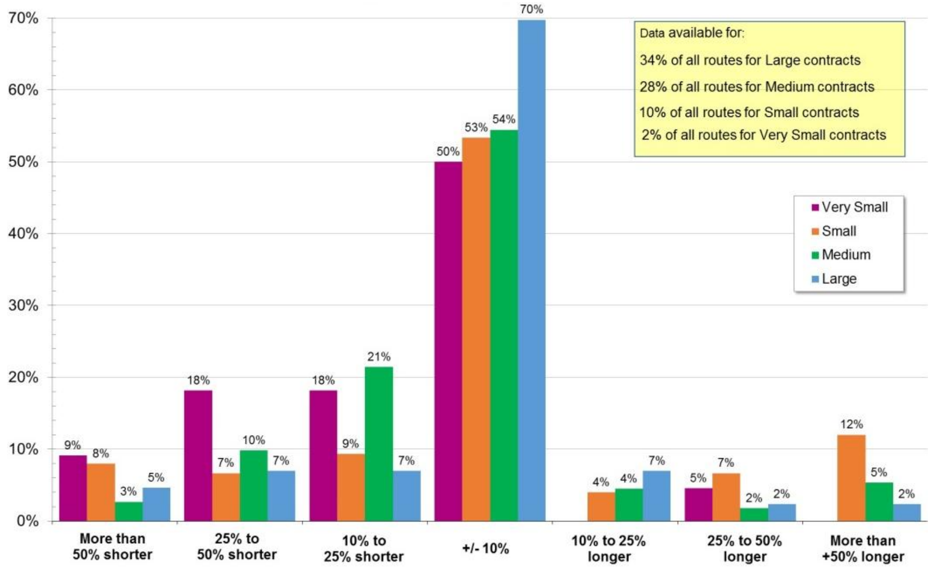


Figure 10 Reported route length compared to measured

In summary:

- 70% of Large contracts and approximately 50% of other contracts have reported route lengths that are within 10% of the measured length;
- 25% of contracts report a route length less than half of the measured length;
- 20% of contracts report a route length 50% greater than the measured length.

There are accuracy issues with measurement, partly because the spatial data is made up of a set of point to point lengths that may understate the actual road length where the road is not actually a straight line, and partly because the actual route travelled may include minor side trips off the road for pick up or drop off (especially for school trips).

An apparent over-estimation of route length could be explained by noting that it is in the operators' interest to claim longer routes. It should be noted, however, that this issue has not been investigated during this study and there is no evidence to support that explanation.

Under-reporting of routes lengths requires a different explanation, because it is clearly not in the operators' interests to under-report. It is possible that the operators involved may not have included deadrun distances in their total route length.

The driving time for the route obviously depends on its length, but also reflects the average speed the bus is able to maintain on the route. A distribution of driving time is presented in Figure 11, and indicates that most routes (75%) are completed in less than 2 hours, and 8% in less than 1 hour.

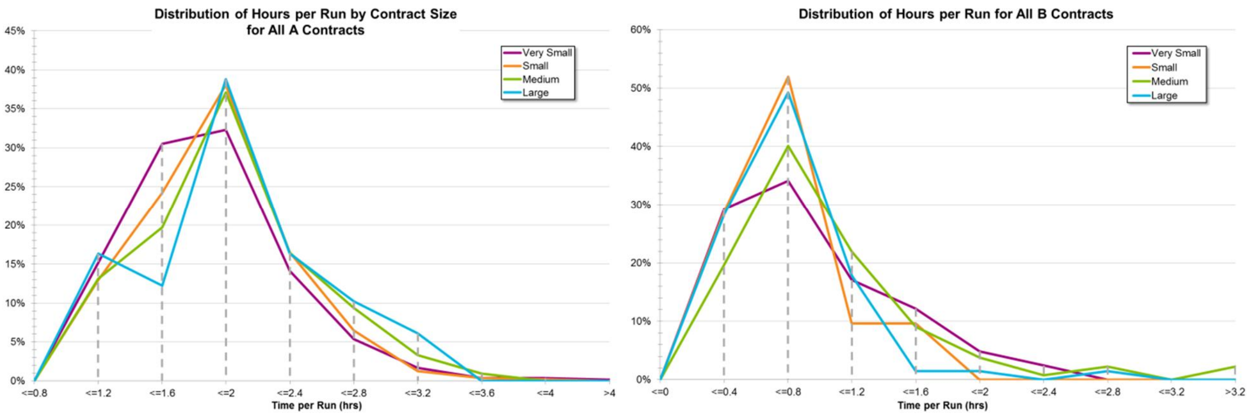


Figure 11 Distribution of driver hours per route for A and B contracts

An analysis of driving time has limited value in isolation. A more useful indicator is the average driving speed for the route, derived from the operators' reported route lengths and driving time. This is shown in Figure 12, for those routes where the data is available.

A small number of the sample indicates average speeds in excess of 70 km per hour, which seems unlikely. For these, it seems likely that the reporting is in error, but an alternative explanation could be that there is either an under-statement of driving time or an over-statement of route length.

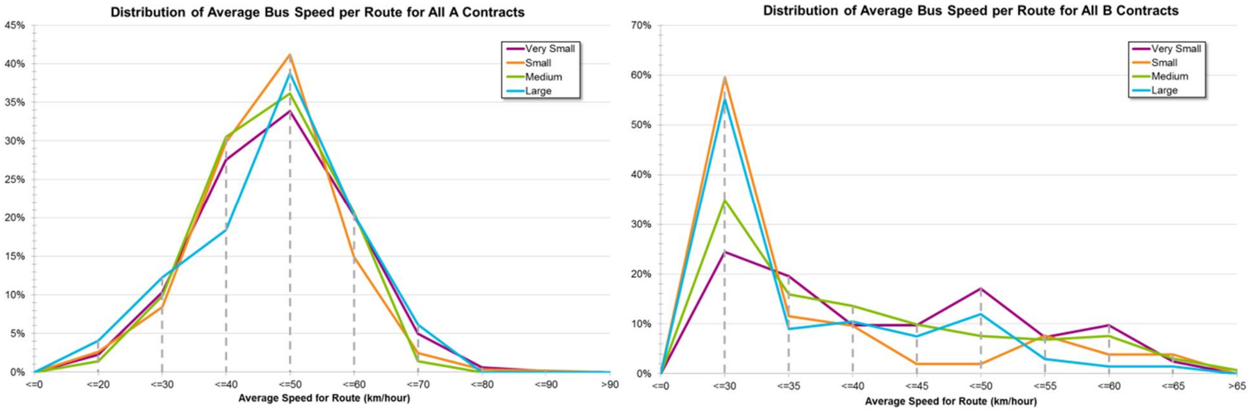


Figure 12 Implied average bus speed over route for A and B contracts

We address the apparent differences between measured and reported route length and driving time in Section 4.0.

2.3 Schedules

Approximately 87% of routes managed by rural and regional contracts are School routes, which involve two trips per week day during the school term. Other routes can involve multiple trips per day, depending on the schedule agreed with TfNSW.

The number of trips per day is shown in Figure 13, which confirms that school routes (A contracts) are operated twice a day, but that other routes vary up to more than 25 trips a day (by operators of Large contracts).

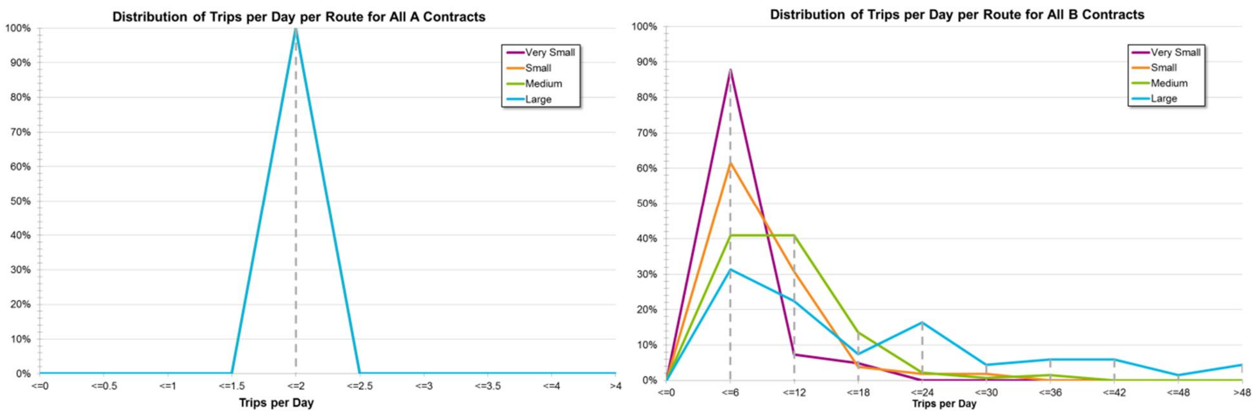


Figure 13 Trips per day by contract size for A and B contracts

2.4 Patronage

The distribution of reported annual passenger numbers by contract size is shown in Figure 14. As would be expected, Very Small contracts carry an average of approximately 49,000 passengers each during the year, but other contracts are considerably more varied. Five contracts, for example, involve more than 500,000 passengers annually.

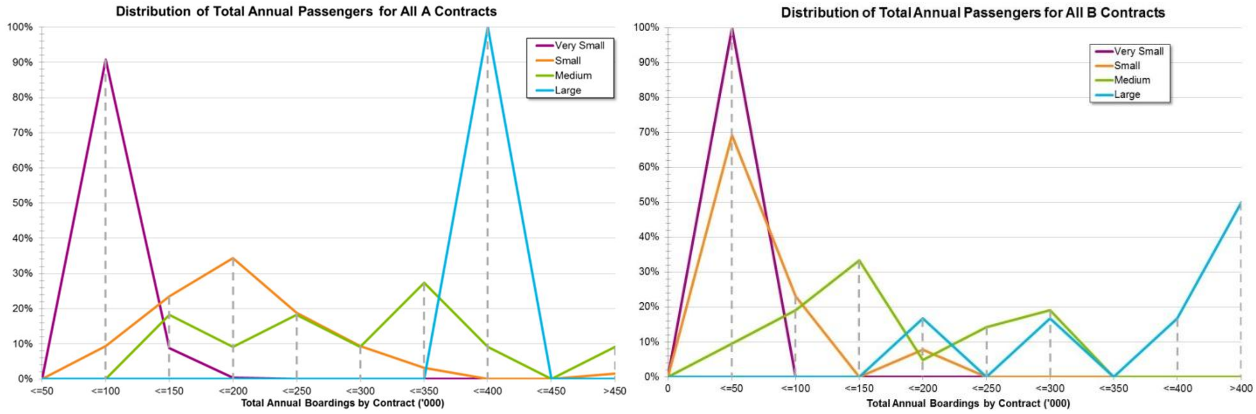


Figure 14 Total reported annual patronage for A (SSTS only) and B contracts (excludes SSTS passengers)

The occupancy of the buses used on routes is a key factor in determining route service efficiency:

- We have used the actual seat capacity of buses allocated to 'A' contracts, and average seat capacity of the operator's fleet for 'B' contracts, to establish capacity.
- We derive bus utilisation as the reported patronage compared to seats available (noting that **operators of school routes report the number of bus passes**, not actual patronage).

There is no data on the distance a passenger travels or where they boarded and alighted the bus. This means that the bus utilisation data reflects the maximum utilisation of the bus. For school buses, this is likely to be the journey leg closest to the school. However, we also note that for 'A' contracts actual patronage is likely to be significantly lower because not all students with bus passes will be using the bus every day and not all students are on the bus for the whole length of the route.

Analysis of data for Medium and Large B Contract operators indicates that 84% of total reported boardings by contract are SSTS passengers on average. There is some variability between the Medium Contracts, but for all Large operators, SSTS passengers are between 80%-90% of all boardings (Figure 15)

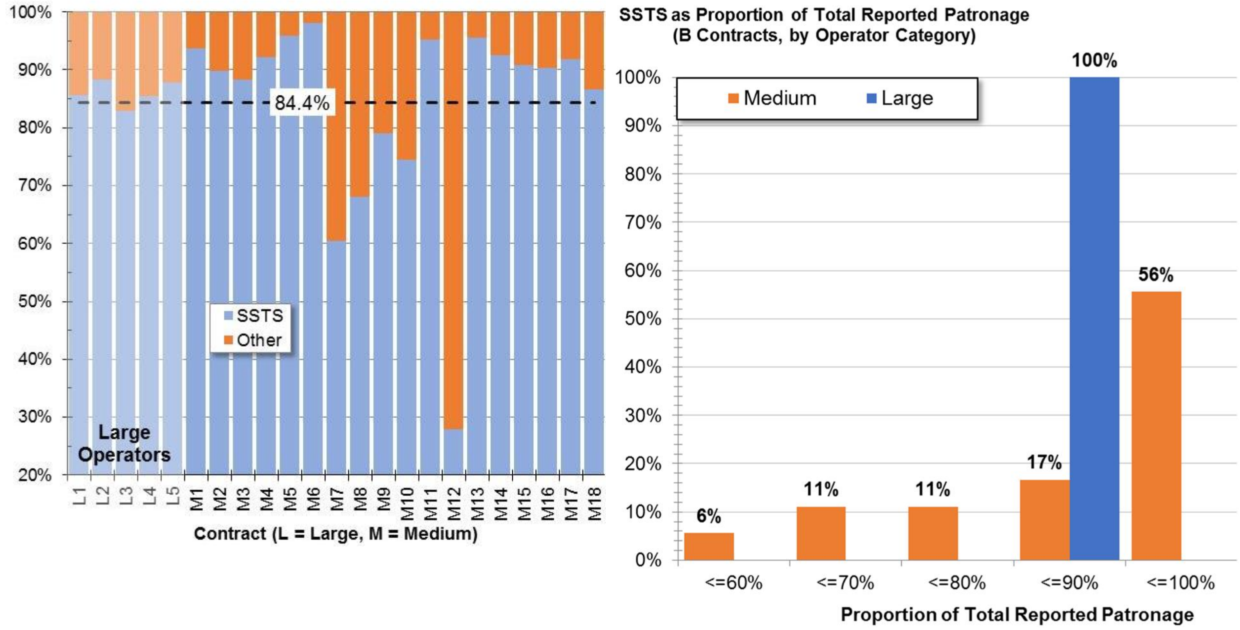


Figure 15 Proportion of SSTS and Regular passengers for Medium and Large B Contract Operators

The data indicates a very significant difference in reported bus utilisation between school services and regular services (Figure 16), noting that for 'A' contracts this reflects the number of bus passes issued not the actual patronage and that for 'B' contracts this excludes school students.

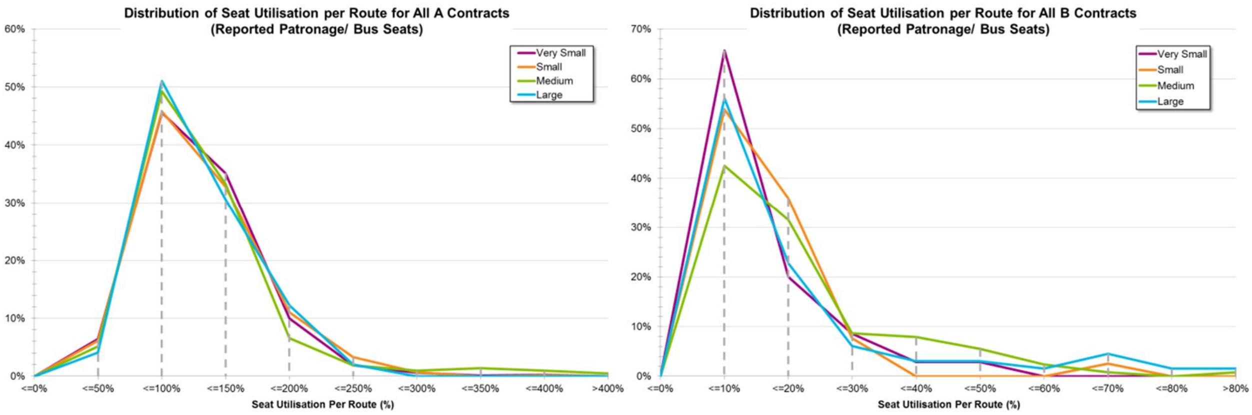


Figure 16 Bus utilisation (occupancy) for A (SSTS passengers only) and B contracts (excluding SSTS passengers)

Only 12% of ‘A’ (school) contracts report average bus utilisation at less than 60% of capacity. In contrast, 96% of non-school (‘B’) contracts report average bus utilisation at less than 60% of capacity, and 50% report average bus utilisation at less than 10%. There is not sufficient data on peak demand to draw any useful conclusions, but we would expect peak to be at least twice the average demand for non-school routes. At the levels of bus utilisation reported, the majority of ‘B’ contracts are unlikely to be at full capacity even during peaks in demand.

The size of bus used on a route will influence the cost of servicing that route. As a rule of thumb, a route with a reported average utilisation of less than 70% is a candidate for use of a smaller bus, which would reduce the cost of servicing that route (noting that Category 4 buses often provide standing room to cater for peak demand which is not available in smaller buses).

This issue is addressed in Section 5.0.

2.5 Service quality and reliability requirements

Limited information is available on service performance by rural and regional operators, whose contracts do not require performance reporting to the same degree as is required by larger urban operators.

TfNSW has a policy of providing one spare bus for every ten routes, or 10% in addition to the service-based contract cost, to enable operators to maintain an appropriate level of reliability by having access to temporary replacements should a bus not be available for service.

This principle is easy to see for ‘A’ contracts that provide school services, where there is generally only one bus per route except for Large contracts (Figure 17). The ‘B’ contracts tend to operate several trips a day on each route, so the buses used are generally a multiple of one per route, which we assume to include the provision for spares.

A 10% provision for redundancy in order to maintain service levels is a common provision in the transit sector, and in the absence of data that demonstrates the need for and the appropriateness of a 10% provision, we accept the principle and the level of redundancy as being prudent.

This provision is included in our assessment of efficient route costs presented in Section 4.0.

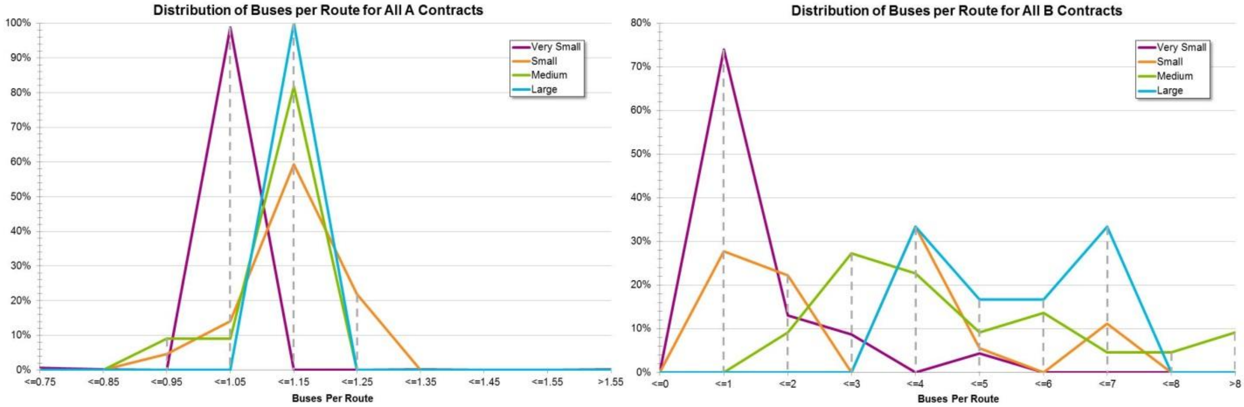


Figure 17 Number of buses per route for A and B contracts

2.6 Contract structure and Government policy

2.6.1 Government Policy

The bus services for rural and regional NSW are administered by Transport for New South Wales (TfNSW) which is responsible for:

> *'strategy, planning, policy, regulation, funding allocation and other non-service delivery functions for all modes of transport in NSW including road, rail, ferry, light rail, point to point, regional air, cycling and walking'*

Their objective is *'to lead the development of a safe, efficient, integrated transport system that keeps people and goods moving, connects communities and shapes the future of our cities, centres and regions.'*

This overall objective is supported by a number of other State initiatives designed to improve transport in regional NSW. This includes $1bn on the regional growth roads program and $200m to accelerate the Bridges for the Bush program, both under its Regional Development Framework and potentially further investment in the enabling infrastructure needed to grow local economies through the Regional Growth Fund which goes live July 2017.

TfNSW state that it *'works closely with State Government and privately owned operators across all transport modes to deliver quality, safe and effective travel and Freight options for the people of NSW'* and that they *'work with bus and coach operators to provide consistent fares, concessions and service standards for customers.'*

In mid-2015, TfNSW initiated a transition of rural and regional bus operator contracts to be more consistent with those used elsewhere in NSW.

Passenger transport is the responsibility of the Minister for Transport and Infrastructure under the *Passenger Transport Act 1990* and the *Passenger Transport Act 2014,* which cover the transport of passengers within or partly within NSW for a fare by vehicle, boat, aircraft or train and extend to community transport.

The purpose of the Act is to:

a. facilitate the delivery of safe, reliable, efficient and integrated public passenger services that are responsive to customer needs,

b. regulate certain public passenger services and the providers of those services,

c. facilitate a flexible service procurement framework for public passenger services for the State that:

  - establish clear lines of accountability for operators of services, and
  - provide mechanisms to improve access to public transport, and
  - encourage innovation in service development, including the use of new technologies.

2.6.2 Bus Operator Contracts

A detailed review of the contracts and changes introduced in 2015 is attached as Appendix B.

The requirements of operators become progressively more demanding and prescriptive with size, as would be expected. Whilst these increases in requirements will attract additional costs, they are likely to be relatively insignificant when compared to the increase in real overhead costs that a larger operation would attract.

Of particular note to this study is the ability and ease that the Operator is able to vary the service, either the route or the fleet, to match the demand and therefore provide a more cost efficient service to the State.

This service provision is covered by Clause 5 of the operator agreements and variations by Clause 5.4. In all cases, a variation to the service requires written agreement from TfNSW but can be initiated by either TfNSW or the Operator.

The change to service could be any of the following:

- Change to route, including adding or removing a stop;
- Change of bus categories on a route;
- Change to bus timetables.

The operator is able to apply for a variation to the service at any time – the Medium and Large Operators are contractually obliged to immediately apply for service variations if they believe the service can be delivered more efficiently and effectively.

It also allows for the operators to apply for a service variation as a result of unforeseen service diversion for at least 2 days. That application must be made within 24hrs of the diversion becoming evident.

Where the operator requests a service variation, they are required to provide details relating to:

- A description of the proposed variation;
- The impact on routes, categories, timetables or services (i.e. schools);
- Any impact on the operator's ability to meet the contract KPIs.

The annual contract price is increased or decreased for each variation in accordance with the change in distance and bus hours and corresponding contract rate.

If the service variation leads to a reduction in the number of buses, the contract price is reduced accordingly. If the variation leads to a change in the category of bus, there are a range of options that TfNSW could instruct, which may include removing the bus from the fleet.

It is unclear how effective the obligation on the operators to identify opportunities to improve service efficiency is in practice. Clearly there is little incentive to identify efficiency improvements if they may result in a reduction in operator revenue, or may lead to the operator prematurely disposing of a bus if that would not be financially beneficial to the operator, or simply that the administration involved may deter the operators from putting proposals forward.

In addition, we would suggest that the sheer number of contracts make it impractical for TfNSW to police this aspect of the service, which would in any case be reliant on the passenger and route data provided. The accuracy and reliability of this data remains unclear to us.

Similar issues are likely to be encountered where there may be untapped demand, where a change to route, or the addition of a stop or a bus would enable the operator to improve the service, even though there is the potential for the operator to increase revenue. In the case of a new bus stop, for the medium and large operators, this would come with added responsibility for securing the necessary approvals for the signage, installing the signage and the ongoing associated maintenance liability. Whilst a relatively infrequent activity, this would need different skills to the operator's core service, which may require the use of contractors. The commercial viability would depend on the likely additional revenue for the operator.

Aside from the contractual obligations, the current contracts appear to offer little incentive for the operators to identify and implement opportunities for more efficient services.

3.0 Bus-related costs

The cost of running buses includes:

- Maintenance;
- Fuel;
- Labour (driver's wages);
- Return of capital (for the purchase cost of the vehicles);
- Return on capital (the financial cost of the capital employed to acquire the vehicle);
- Annual fixed costs such as insurance, and allocation of company overhead (which is not a vehicle-related cost).

These are each considered in turn, and are compared to actual costs reported to TfNSW in Section 6.

3.1 Vehicle maintenance costs

This study was required to provide efficient unit costs for the bus fleet.

Maintenance costs include all recommended and scheduled interventions specified by the vehicle manufacturer or otherwise considered necessary, and are variable costs in that they are generally scheduled primarily by intervals of distance travelled (and occasionally by time interval). We are therefore able to develop 'standardised' unit costs for each vehicle in each bus category based on manufacturer's recommendations and assumptions of distance travelled, and to derive a 'standard' annual cost for the vehicle.

We have developed a financial model that uses the data provided to develop 'standard' unit costs based on whole-of-life cost projections for representative vehicles in each bus category, and to provide a means of modifying the 'standard' unit costs for individual routes based on stated route distance and scheduled duration. The charts indicated in this section are taken from this model.

Examples of planned maintenance as recommended by the manufacturer and the associated costs provided by our cost estimators are shown in Figure 18. These costs are based on:

- Manufacturer's recommendations for maintenance interventions and intervals;
- Costs for parts, consumables and labour provided by our cost estimators for regional NSW;
- An expected service life that corresponds to the maximum life currently specified by TfNSW for each category of bus (shown on the horizontal axis);
- Vehicle duty factors (distance travelled and time driven) that are equivalent to the current experience by rural and regional bus services in NSW (using the average reported by each vehicle category), referred to as planned annual kilometres.
- An allowance of 10% to provide for unscheduled maintenance.

The maintenance costs indicated in the bars and the left vertical axis of Figure 18 are shown as a percentage of the current replacement cost of the vehicle, taken from the current TfNSW panel or an average of recent reported purchases of the vehicle for rural and regional bus service purposes.

The charts are overlaid with two horizontal lines, using the right vertical axis, indicating the:

- Assessed mean annual maintenance cost (labelled);
- Mean annual return of capital (depreciation) implied by the purchase price and the nominal asset life expected from the vehicle (also labelled).

The residual value of the vehicle at the end of the maximum service life mandated by TfNSW has not been included for derivation of unit cost purposes.

The charts indicate (in text boxes) the derived unit cost per standard kilometre for capital recovery and maintenance, and the current replacement cost for the vehicle.

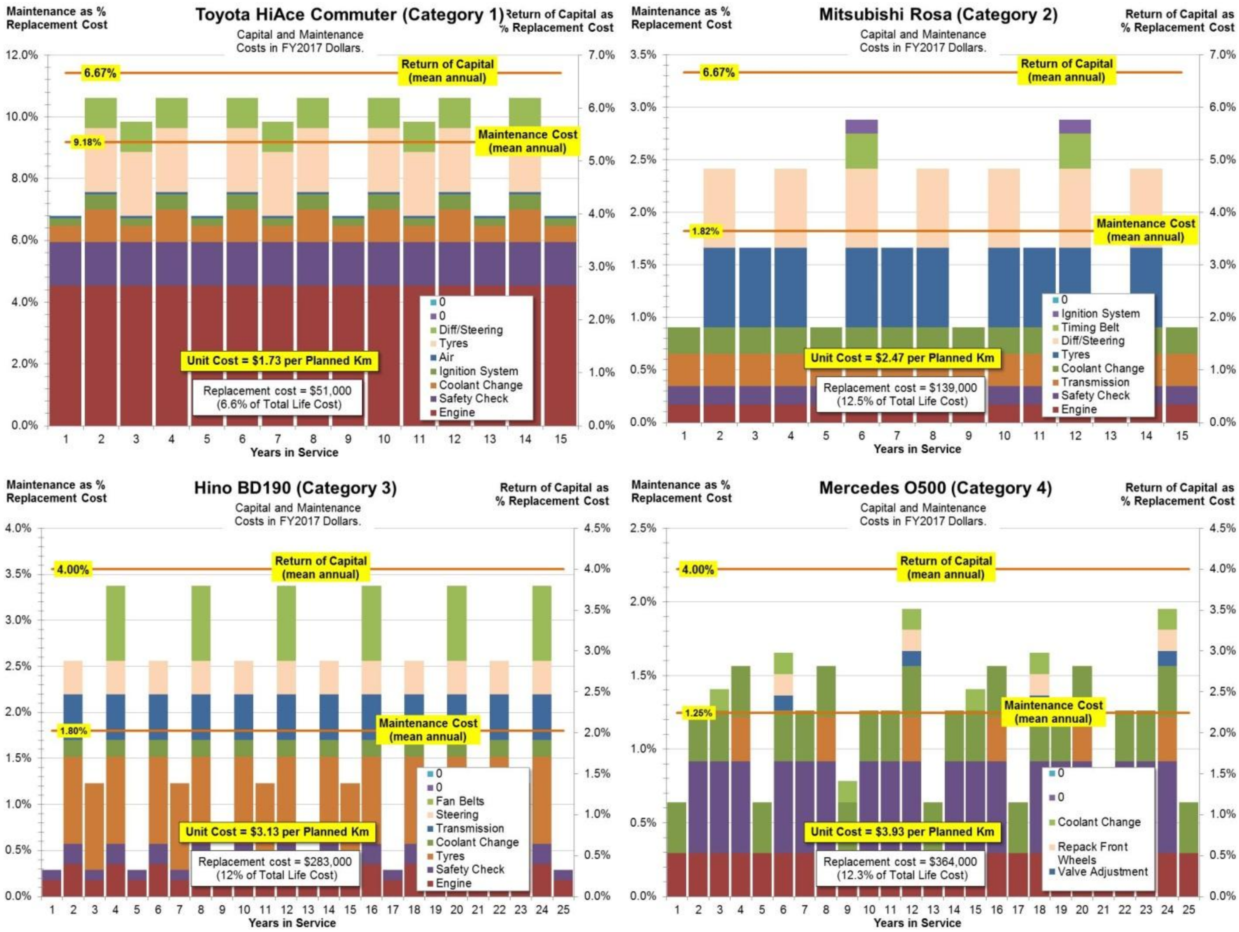


Figure 18 Planned maintenance costs by bus type

The unit costs derived from the model are used to determine the cost of running each vehicle with specific duty factors (routes), and to compare the cost of using a variety of vehicles on specific routes.

3.2 Fuel costs

The cost of fuel required to run each vehicle depends on the prevailing price of diesel in regional NSW and the expected fuel consumption of the vehicle.

For the purposes of this study, the cost of diesel used in the model has been taken from the mean cost of diesel in NSW for the immediate past year.[4] This cost is included in the model as a variable so that sensitivity of unit costs to fuel prices can be evaluated.

Fuel consumption has been taken from manufacturer's recommendations, expressed as litres per 100 kilometres with an additional 10% to reflect that in practice, fuel consumption is likely to be greater than manufacturers published figures.

The 'standard' fuel cost per km by bus category is shown in Figure 19.

Figure 19 Fuel consumption per km by bus category

[4] Taken from Orima Research as reported at http://www.aip.com.au/pricing/retail/diesel/charts/nsw_regional_average_charts.htm

3.3 Bus driver (labour) costs

3.3.1 Development of Labour Costs

The Fair Work Commission reviews and sets minimum wages for employees in the national workplace relations system. These reviews are typically completed from March to June and come into operation on 1 July of the following financial year.

Employers and employees in the 'passenger vehicle transportation industry' throughout Australia are covered by the Passenger Vehicle Transportation Award 2010[5] (MA000063), which includes the transport of passengers by bus or coach. There are limited exceptions, including employees (or their employers) which are covered by a State reference public sector modern award or a State reference public sector transitional award, but for the purposes of this assessment it has been assumed that all drivers of the vehicles are subject to the Award.

In many cases drivers are paid rates above the minimums required by the Award via Enterprise Agreements (EAs). Those operators that do not have an EA (typically the smaller operators) tend to use labour rates provided by BusNSW. The EA and BusNSW hourly rates are similar (both are higher than the award rates).

While negotiated labour rates are greater than award rates, there does not appear to be a market-driven basis for this:

- Unemployment statistics indicate that unemployment rates in rural and regional areas in NSW remain 40% greater than in capital areas (although the gap has recently been decreasing). This does not suggest a shortage of labour in rural and regional areas.
- The need to qualify as a bus driver is unlikely to be a barrier to employment. Drivers are required to complete Bus Driver Authority training, but this is offered in-house by some of the larger operators and is otherwise readily available from commercial driver training organisations.

Following stakeholder feedback, for the purposes of this review, we have used current negotiated EAs as the basis for estimating the efficient cost of driving a bus, but we have provided an indication of the cost impact compared to the use of Award rates.

Using a typical current EA, we have established a 'standard' unit cost for a driver of a vehicle in each bus category based on the average annual distance travelled and driver hours required, and expressed that as a per kilometre rate. This rate is applied to each route, where route-specific driver time is estimated and included to calculate the efficient cost of the route.

It should be noted that the Award has several employee grades reflecting vehicle size (number of seats) and the scheduled hours of driving required, but the EA uses a single rate to cover all grades. For the purposes of this study, these variations have been ignored.

The award provides for employees to be engaged on a full time, part time and casual basis, defined as in Table 1. The normal working week is 38 hours on up to 5 of 7 consecutive days. Ordinary hours (excluding meal breaks) must not exceed 10 hours in any one day).

[5] https://www.fwc.gov.au/documents/documents/modern_awards/award/ma000063/default.htm, accessed 28 June2017.

Table 1 Employment types and summary conditions

Employee type	Full time	Part time	Casual
Hours per week	38 hrs per week (average)	As agreed	As agreed
Payment for ordinary time	See Table 3	1/38th of the weekly rate / hr	1/38th of the weekly rate / hr
Loading	-	-	Plus 25% of the ordinary time for the week worked
Minimum payment		3 hrs for each day (pro rata from ordinary 38 hr week)	3hrs for each shift If employed solely for school runs, then minimum 2 hrs for each engagement (i.e. 4 hrs if both runs to and from school are completed).
Overtime hours	See Table 3	Hours in excess of agreed hours at appropriate over time rate.	-

Payment varies by the grade of employee, which is reflective of the skills required to complete the activity. This grade classification and minimum weekly wage is presented in Table 2.

Table 2 Employee Grade Classifications under the award

Employee Grade	Driving passenger vehicles			Other activities
	School Services	Regular Route Services	Coach/ Charter	
1	-	-		Activities not involving the driving of vehicles with passengers on board: · Vehicle cleaning and washing · Yard maintenance · Oiling, greasing, refuelling and maintenance · Tyre changing · Supervision of school children on vehicles / coach attendants
2	< 25 pax	-	-	· Ticketing, conducting, customer relations etc
3	> 25 pax	< 25 pax	< 650km	
4	As 3	> 25 pax	> 650km	Including issuing tickets and inspecting passes, and being away from home overnight
5	As 4			Duties of a driver and may induct and instruct new drivers.
6	As 5			Duties of a driver plus: · Driver training, induction and monitoring of new drivers · Infill driving in other depots

The wages vary by grade and are subject to additional allowances. These are summarised in Table 3.

Table 3 Minimum Wages and allowances

Driver Grade	Ordinary Hours		Overtime		Saturday	Sunday	Public Holiday
	Minimum weekly rate ($)	Minimum Hourly Rate	Up to 3hrs	Thereafter			
Multiplier	38.0	1.0	1.5	2.0	1.5	2.0	2.5
1	$749.60	$19.73	$29.59	$39.45	$29.59	$39.45	$49.32
2	$767.80	$20.21	$30.31	$40.41	$30.31	$40.41	$50.51
3	$811.80	$21.36	$32.04	$42.73	$32.04	$42.73	$53.41
4	$840.20	$22.11	$33.17	$44.22	$33.17	$44.22	$55.28
5	$886.60	$23.33	$35.00	$46.66	$35.00	$46.66	$58.33
6	$925.70	$24.36	$36.54	$48.72	$36.54	$48.72	$60.90

Notes:

- Current at July 2017.
- Junior employees not shown as the full adult rate applies if the junior employee is driving a passenger vehicle.
- Relate to single driver operations only

Based on an assessment of the proportion of routes completed at weekends and public holidays, an allowance has been made to the rates above to reflect the multipliers in Table 3 and the minimum engagement length referred to in Table 1 applied on a route-by-route basis.

Additional loadings have also been included for non-driving hours, paid leave periods, training , Workcover and superannuation. A combined loading of 43% has been applied to the EA rate. For casual drivers (commonly used for school services), the combined loading is 46%, which includes the 25% casual loading (see Figure 20).

The following additional allowances are also applicable (). These allowances have not been included in the cost modelling.

Table 4 Driver allowances

Allowances	Rate (as stated in the Award)
Articulated bus allowance (Category 5)	1.56% of the standard rate per shift
Living away from home allowance	a minimum of 8 hours total pay per day (including weekend penalties), even when less is worked
Meal allowance	$12.55 for a meal
Travelling time allowance - commencing away from usual workplace	payment at the minimum hourly rate for all time spent travelling in excess of the time normally spent in travelling to and from home
Travelling time reimbursement - commencing away from usual workplace	reimbursement for any reasonable cost when travelling in excess of the time normally spent in travelling to and from home
Waiting time - coach or bus driver - single day charter	50% of the ordinary hourly rate of pay plus any applicable loading or penalty

Figure 20 Buildup of Driver Hourly Cost

Step	Component	Applies to:[6]		Approach
A	**Driver Salary**	**P**	**C**	
A.1	Base Hourly Rate	l	l	The hourly rate for a driver as stated in the EAs
A.2	Casual Loading		l	A loading of 24.58% (EA) applied to the Base Hourly Rate for ordinary hours.
B	**Recovery of non-working time**			**The total of all the non-working time was recovered over the balance of the year.**
B.1	Annual Leave Periods	l		Drivers are entitled to 4 weeks paid leave per year under the NES[7].
B.2	Public Holidays	l		Allowance for 10 paid public holidays per year.
B.3	Personal Carers Leave	l		Drivers are entitled to 10days of paid personal carers leave per year under the NES.
B.4	Long Service Leave	l	l	After 10 years service, drivers are entitled to 2 months (8.67 weeks) paid long service leave. This was approximated to 0.87 weeks per year
B.5	Driver Training	l	l	It was assumed that each driver would have refresher or route training for 1 week every year.
B.6	Safety Talks	l	l	An allowance of 15minutes each week of the year for safety talks or training was included.
C	**Allowances**			
C.1	Superannuation	l	l	A rate of 9.5% of the total cost of A and B above.
C.2	Workcover	l	l	A rate of 2.5% of the total of A, B and C.1.

In addition, the EAs include a driver/conductor allowance of about $15/day. This is paid irrespective of the length of shift and is to cover the added responsibility of issuing tickets and inspecting passes. This allowance is not included in the Award and is not included in this analysis.

In our cost model, we have used casual drivers (with appropriate uplift) for school services, and permanent employees otherwise (our assessment suggests that in practise there is little difference in overall cost between permanent and casual employees).

3.3.2 Driver costs by bus category

Application of EA rates to the NSW rural and regional bus fleet depends on route constraints such as driving time (where a part-shift is affected by award conditions, for example). The EA rate used for this analysis is **$38.36 per hour** (irrespective of vehicle size)[8].

The build-up of this hourly rate has been revised from that presented in the Draft version of this report which has resulted in a small reduction in the hourly driver cost.

This cost can be expressed on a per km basis assuming a standard total driving time and a standard total distance covered in a year. For the purposes of this analysis, the standard hours and distance have been taken as the current averages for all vehicles in the fleet in each bus Category.

The implied 'standard' driver cost per km by bus category is shown in .

Figure 21 Driver costs per km using standard route assumptions

3.4 Return of capital

The purchase cost of each bus has been assumed to be returned based on straight line depreciation using an assumed regulatory (service) life for the vehicle. Actual life of the bus is longer than TfNSW's mandated maximum bus age, so this approach means that there will be a residual book value for the vehicle at the end of its contracted service life. Following advice provided by IPART, the capital value is returned over the TfNSW maximum service life, and the residual value of the vehicle has been ignored.

For the purposes of this analysis, return of capital has been calculated assuming as the purchase cost either the current cost for a similar vehicle in the current TfNSW panel (with an additional allowance for the fitting of 2 for 3 seatbelts where appropriate), or the average purchase cost (in FY2016-17 dollars) of recent purchases recorded by TfNSW.

The return of capital is therefore the 'standard' purchase cost divided by the expected asset life, recovered during the mandated service life of the vehicle.

TfNSW mandates maximum service life of 15 years for buses in Categories 1, 2 and 3, and 25 years for buses in Category 4, which leaves each bus at least an additional 5 years of expected asset life after use by TfNSW.

The duty of buses in rural and regional service is considerably lighter than it is for urban use. Category 3 and 4 buses average only 30,000 km per annum, whereas they could achieve 10 times that in an urban setting. The return on capital per km required for buses in rural and regional services is therefore considerably higher than it would be in an urban context.

The implied 'standard' driver cost per km by bus category is shown in Figure 22.

Figure 22 Return of capital per km by bus category

3.5 Return on capital and tax

The purchase of a bus incurs a funding cost, which has been estimated using a Weighted Average Cost of Capital (WACC) considered appropriate for the sector.

IPART has recommended that a real post-tax WACC of 5.2% be used for this purpose, applied to the value of the bus half-way through its service life. This has been expressed as the mean annual return on capital applicable for each vehicle. We have separately calculated a tax allowance based on IPART's standard approach.

This approach matches the TfNSW maximum average age requirement for the fleet, and should therefore be reliable for operators with many buses (although less so for operators with a small number of buses where actual age will be more significant.

This result has been turned into a per km unit cost using the average annual distance covered in each bus category.

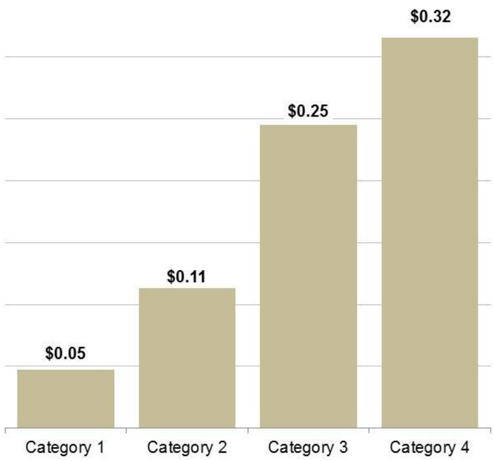


Figure 23 Return on capital per km by bus category

The implied 'standard' return on capital cost plus tax allowance per km by bus category is shown in Figure 23.

3.6 Overhead (fixed) costs allocated to buses

Overhead costs are considered to be 'fixed' or not related to the distance travelled by each bus. The establishment of efficient unit costs for buses, however, requires an allocation of overheads incurred by the operators to each vehicle. There are several allocators for these costs, including the number of buses operated (which is also a proxy for the number of staff employed), passenger numbers, total seat capacity, total distance travelled, total direct cost incurred, and various combinations of these.

The data provided by operators to TfNSW includes a single cost called 'Other', which is distinct from bus-related depreciation, maintenance costs and driver costs that are also reported. No detail is provided of the 'Other' category, so we have assumed that it primarily represents fixed overhead costs incurred by the operator.

Although 'Other' costs are reported by route, the overhead functions involved are likely to be consolidated for operators holding more than one contract and multiple routes. For overhead allocation, we therefore refer to operator costs rather than contract costs.

Analysis of the data reported by operators to TfNSW shows that the best correlation of Other costs is with total seat capacity, for operators with contracts involving approximately 100 seats or more. We have therefore adopted contract seat capacity to allocate contract 'Other' costs (assumed to be overheads), with a further provision for operators with less than 100 total contracted seats as noted below.

Data provided to TfNSW for their Outer Metro contract negotiation included more detail of 'fixed' costs (refer to Figure 24), which includes management salaries, and we have assumed that rural and regional operators have provided their cost reports on a similar basis.

We have also benchmarked these costs to assess the scale of overhead costs, using recent contestable contracts (including the Sydney Outer Metro and recent contracts in Western Australia) as a basis for evaluating the NSW rural and regional contract overheads.

Type	Cost Item
Fixed	Depot insurance
Fixed	Lease Rental Charges - Depots (non related parties)
Fixed	Admin and management salaries & wages
Fixed	Admin and management on costs
Fixed	Agency & contract staff
Fixed	Agent's commission
Fixed	Accounting, consulting & legal fees
Fixed	Advertising / marketing
Fixed	Cleaning (office / depot)
Fixed	Communications - operational
Fixed	Communications - non-operational
Fixed	Information Technology
Fixed	Printing/stationary (excl tickets & timetables)
Fixed	Rates & taxes (property related)
Fixed	Rent (non depot)
Fixed	Repairs & maintenance (non fleet)
Fixed	Shareholder / management fees
Fixed	Staff related expenses
Fixed	Staff training & recruitment
Fixed	Timetables (production, printing & delivery)
Fixed	Utilities (gas, water & electricity)
Fixed	Other

Figure 24 Fixed cost categories identified by Outer Metro operators

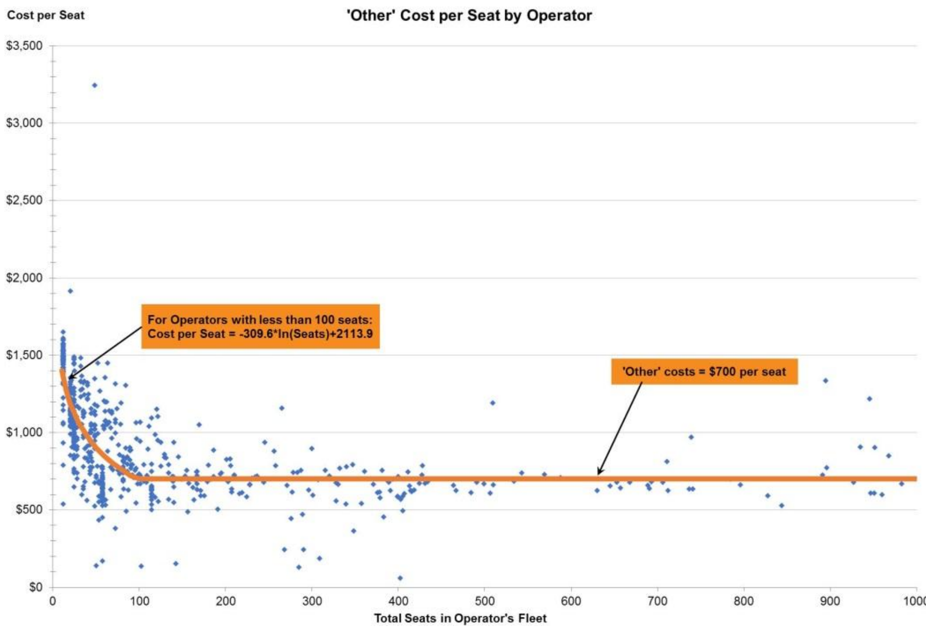


Figure 25 Distribution of 'Other' costs per seat by contract

Our analysis of the contract data provided by TfNSW suggests that 'Other' costs, allocated on a per seat basis, would average $700 per seat in FY2016-17 dollars.

This would apply to all Large, Medium and Small contracts (as categorised by TfNSW), and to approximately 32% of Very Small contracts.

For smaller contracts, '*Other' cost per seat* tends to increase as the contract reduces in size (Figure 25).

There are outliers with higher Other costs per seat, and in the absence of a means to assess efficiency of overheads, we conclude for the purposes of this study that they are less efficient.

There are 64 contracts with only 1 minibus (14% of Very Small contracts), for whom 'Other' costs average $1,400 per seat.

For simplicity, we have assumed that a logarithmic relationship should hold true for Other costs per seat these small contracts, and have applied that to derive unit costs for operators with less than 100 contracted seats.

This delivers the reported average for this measure for contracts with only 1 minibus ($1,400 per seat).

A comparison of the 'Other' costs per seat measure to benchmarks is included in Section 5.0.

The implied 'standard' overhead allocation to bus by category is shown in Figure 26.

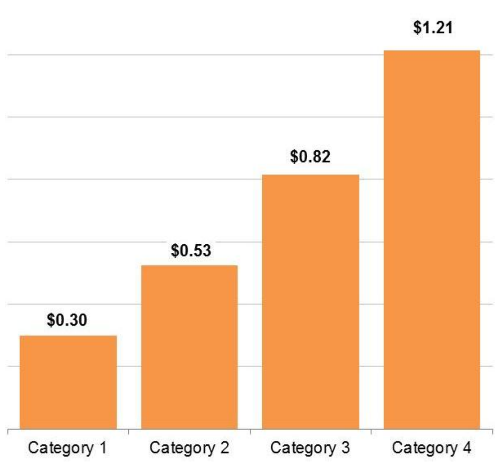


Figure 26 Overhead costs allocated by bus category

3.7 Summary of unit costs by bus category

The assessed costs per km travelled are shown by bus category in Figure 29, based on the reported average annual distance travelled by buses in each category.

In relation to the unit costs presented in Figure 29:

- Driver costs are clearly one of the most significant cost components in relation to bus operations, representing 56% of total unit costs for Category 1 buses, reducing to about 30% for Category 4 buses.
- The EA rates are higher than the Award rates, as noted in Section 3.3. Since either of these could, in principle, be used, it may be helpful to consider driver costs as a range. Using the Award rates reduces the driver cost per hour from $38.36 per hour to $32.34 per hour.[10] Figure 27 shows the range of costs per km depending on the wage rate used, and Figure 28, which shows the impact of the alternative wage rate on total bus cost per km.

[10] Our draft report included a driver cost under the Award of $40.30-$41.90 per hour. These included the sign on/off times and minimum shift length allowances for casuals which are now included when estimating the route cost. See Figure 20 and Figure 36 for more information.

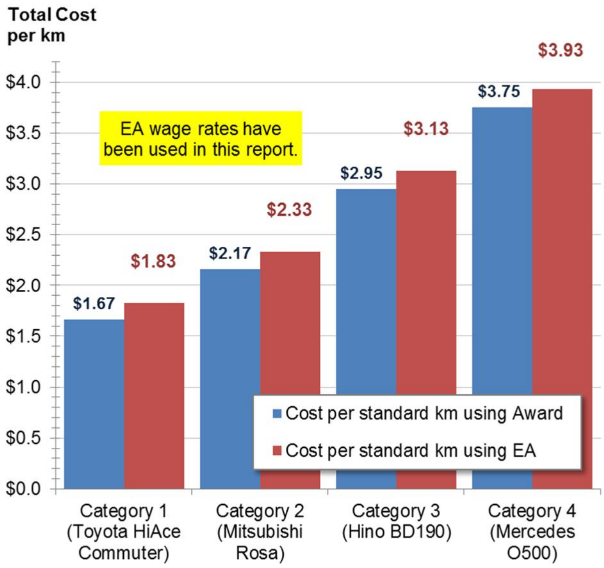


Figure 27 Total bus cost per standard km by Driver wage rate used

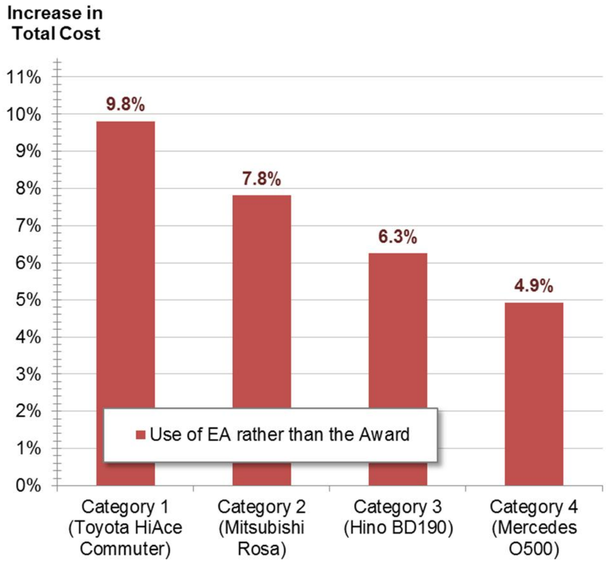


Figure 28 Impact on total bus cost per km of EA compared to Award

- Overhead allocations are being made on a per seat basis, and are therefore more significant for larger buses.
- Financial costs (return of and on capital) increase in relevance as bus size increases, ranging from only 4% of total unit costs for a Category 1 bus to between 21% and 23% for a Category 4 bus. The TfNSW panel of models available for Category 4 includes a range of buses with purchase costs varying 36% between the least and most expensive options. The use of a model at the top end of the range will therefore add about 10% to the unit cost of the bus, compared to the use of a model at the bottom of the range (assuming other factors remain being equal).
- In all cases, maintenance costs are a minor component of the unit cost of a bus.

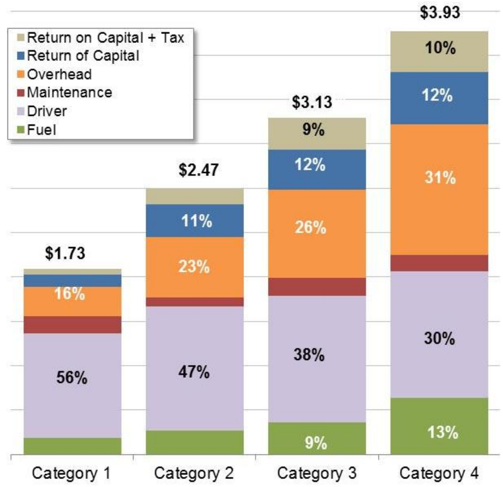


Figure 29 Unit costs by bus category at standard annual distance travelled

- The unit costs reflect the relatively light duty of this bus fleet when compared to urban fleets.

The total annual cost of operating these buses is shown in Figure 30.

Since the unit costs include some cost types that are not based on distance travelled, the total unit cost for a bus will change according to the actual planned distance for a specific route.

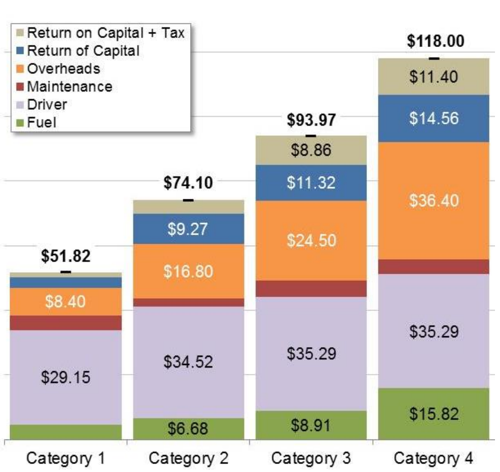


Figure 30 Total annual cost by bus category (standard distance travelled, $'000 2017)

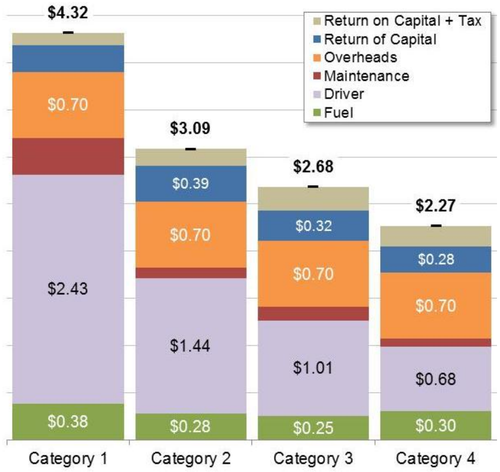


Figure 31 Annual cost per seat by bus category (standard distance travelled, $'000 2017)

The TfNSW bus categories are based on the number of seats in each bus model. The same unit costs, expressed as a cost per seat rather than per km, are presented in Figure 31 (using the same annual distance travelled by bus category throughout this analysis).

The larger buses, with more seating capacity, are less costly to operate on a per-seat (or per passenger, if the bus is operated at full capacity) basis. Subject to the stated assumptions of distance travelled, a minibus (Category 1) is twice as expensive to operate per seat as a Category 4 model (assuming that both vehicles are used at full capacity).

This cost can be stated as a cost per passenger km, by dividing the total cost by the distance travelled and the number of passengers carried. This is shown in Figure 32, which has been derived for 'A' contracts that typically have relatively high utilisation (shown as a line in the figure).

Use of a Category 4 bus at full capacity (approximately 100% utilised) would incur a cost of $0.069 per passenger at the standard annual distance used to derive unit costs (30,000 km for this Category), whereas use of a Category 1 bus costs $0.159 per passenger km.

If the bus is not being used at full capacity, the cost per passenger km will increase proportionately. A Category 4 bus run at an average of 10% utilisation (capacity) would cost $0.69 per passenger km, a considerably higher cost than use of a Category 1 bus would incur (refer to Section 5.1 for commentary on this topic).

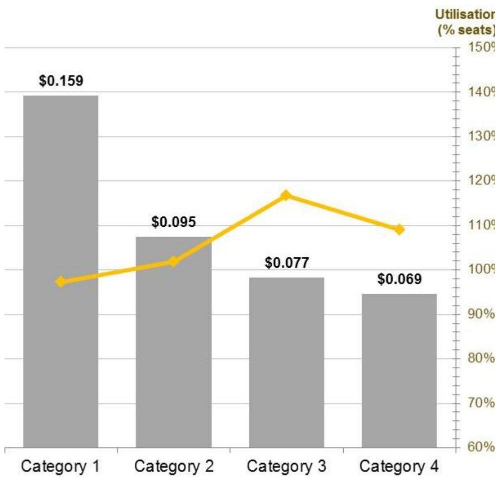


Figure 32 Annual cost per passenger km

The change in cost per seat km as a result of changes in the annual distance travelled is shown for each bus category in Figure 33.

Modelling indicates that if the annual distance travelled is twice the current average for a bus category, total unit costs per km will reduce to between 87% and 73% of the 'standardised' unit cost reported above.

Operating costs are effectively independent of passenger numbers, so recovery of these costs is determined by average utilisation. This issue is addressed in the discussion on Marginal Costs (Section 5.1).

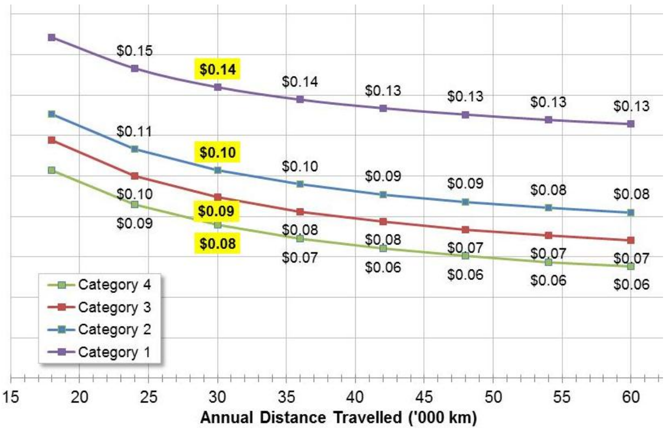


Figure 33 The change in cost per seat km by bus category and annual distance travelled

The relationship between unit costs and distance travelled by bus category is indicated in Figure 34.

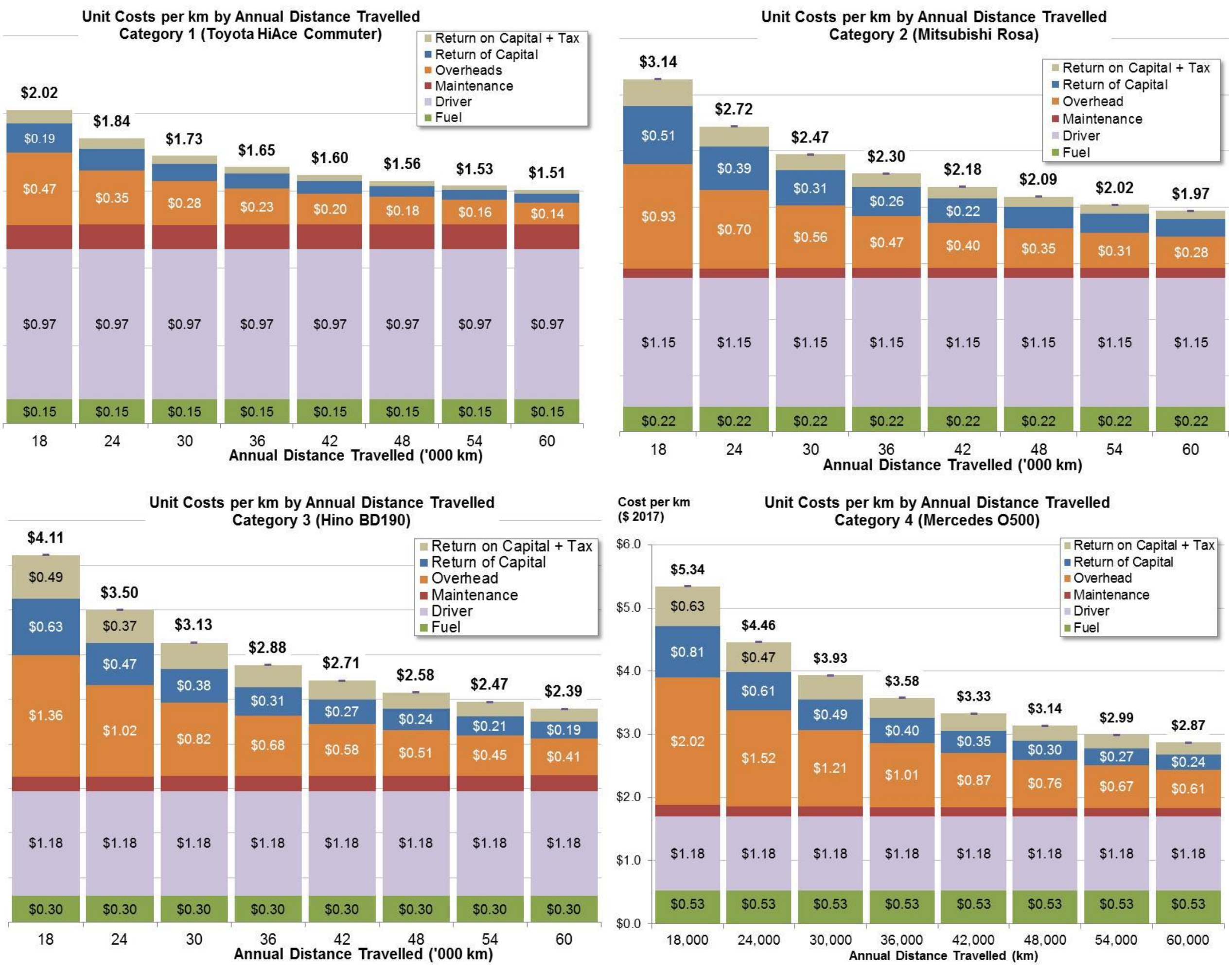


Figure 34 Unit cost variations by annual mileage by bus category

The main cost type affected is the overhead cost allocation, which does not appear to be influenced by the distance travelled by the fleet.

Annual costs for the bus also increase with distance travelled:

- Fuel costs are distance-based, and therefore increase accordingly;

- Driver costs are time based, but the bus travels at a more or less consistent speed when doing its scheduled routes, so the driving time is closely related to distance travelled. There will be minor impacts in practice where shift lengths and related factors included in the award come into play.
- Maintenance tends to be carried out at intervals that are primarily distance based, so if annual distance is increased the time interval between scheduled maintenance interventions will reduce, which may therefore result in higher annual costs for maintenance.
- The other cost types are annual, and will therefore not be affected by distance travelled.

4.0 Efficient operational and capital costs by contract

In this section we apply the unit cost rates determined for buses representative of each TfNSW category to the routes included in the rural and regional contracts.

4.1 Route Length and Duration

In Section 2.2 we noted that for approximately 50% of routes the reported route distance and driving time is within 10% of the distance measured from spatial data for the routes provided by TfNSW (after providing for any deadruns needed). Of the remainder, approximately 20% of the reported distances were considerably higher than measured, and 30% were shorter.

We have undertaken spot checks where possible, using published route schedules and Google Maps, to investigate significant variances between reported and measured distances, and found that this alternative method supports the route lengths indicated from the spatial data provided.

We have therefore concluded that where there is a significant difference between reported and measured route distance, the latter is more accurate and is a more reliable measure. We have noted that the spatial data itself has an accuracy constraint, so we propose to allow for that in the route distance used to establish the efficient cost of the route. We have therefore taken, for all routes, 110% of the measured route length to be the ‘efficient’ length for the purposes of this study.

Where operators have published schedules for their communities, it has been straightforward to establish the route duration (being the time difference between the scheduled start and finish). In most cases it has also been possible to establish the deadrun distance to and from the depot, and to estimate the driving time required to cover that distance at a reasonable speed in an empty bus.

The total assessed driving time tends to compare favourably with those times as reported by operators, so we have concluded that the measured route duration is a reasonable method to establish route duration and total driving time. Where route distance and duration has not been provided by the operator, we have relied on the measured distance to establish route length, and applied the average speed achieved in comparable routes to estimate route duration.

4.2 Bus Category Used

The running cost of buses in higher Categories is higher than for buses in lower Categories. Since this cost is effectively fixed for a given route and bus, the ability to recover the running cost from passengers depends on the average occupancy or utilisation of the bus. There is a level of bus utilisation below which it would be more cost effective to allocate a smaller bus to the route.

This is illustrated in Figure 35, which uses the standardised unit costs for buses in each Category to show the effective cost per passenger as patronage reduces.

This comparison is made using average patronage numbers, and provision would need to be made for peak loading, noting that buses in Categories 3 and lower generally do not provide standing room.

It should be noted that the terms of the contract with TfNSW may make it difficult to downsize quickly. For the purposes of this study, however, we have identified current routes where the current bus could be down-sized and allocated a lower-cost bus where it would provide a more cost-efficient outcome for the State. The impact of this approach is summarised in Section 5.0.

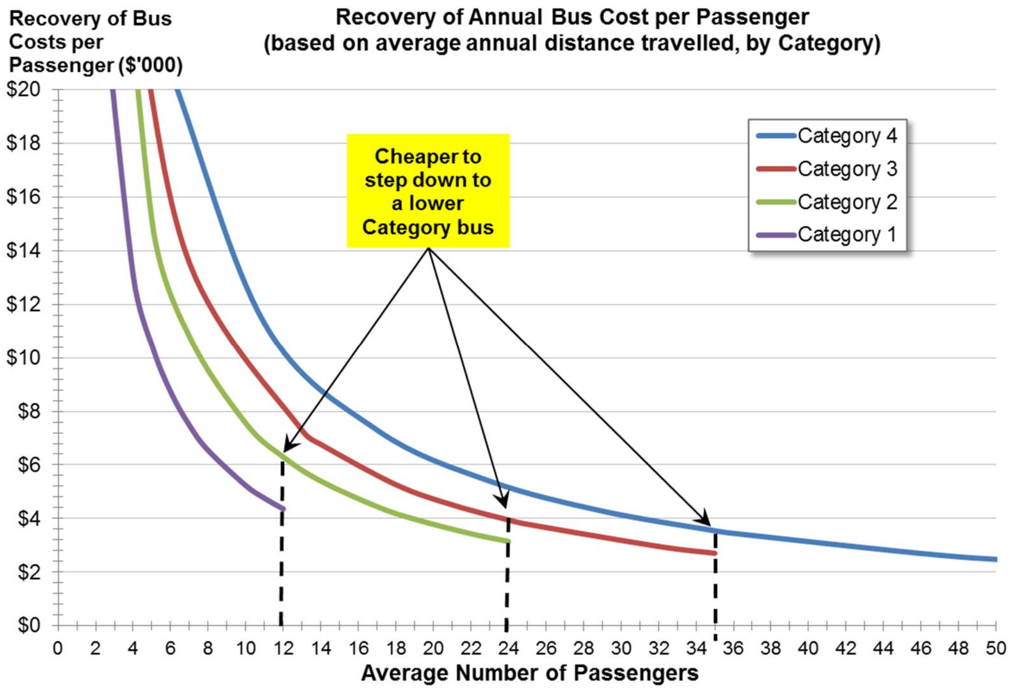


Figure 35 Cost effective allocation of buses

Figure 35 demonstrates that it is always more cost effective to downsize the bus as soon as patronage reduces to the seating capacity of the lower Category bus. In practice, there is risk of over-crowding or leaving passengers behind if the step down is carried out immediately, so we have assumed it could be done with one spare seat in the lower Category bus (as a nominal provision for peak demand).

4.3 Route cost estimation using bus unit costs

Efficient unit costs have been established for representative buses in each TfNSW Category (refer to Section 2.6.1). These are summarised in Table 5, using nominal driving time and route duration, where:

- One vehicle has been selected to represent the group in each TfNSW Category:
  - For Categories 1 and 2, the vehicles shown are by far the dominant model used in the Category, so the unit costs shown may be applied to buses in those Categories with a high level of confidence.
  - For the other Categories, the selected vehicles are based around the most frequently used in the Category, a wide range of models are in use, so the unit costs need to be taken as 'typical'. In practice, the cost types that could differ by bus model are fuel consumption and maintenance costs:
    - § Fuel costs vary from 8.4% to 13.4% of the total unit cost across the fleet, with the larger buses consuming more fuel. The variation in fuel consumption within a bus Category appears to be less than 1.5% of the total cost, so variations in fuel consumption have only a minor effect on total costs.
    - § Maintenance costs vary between 3.6% and 8.5% of total unit costs across the fleet, but variations within a bus Category are typically less than 2.0% of total unit costs and can be considered to have a minor impact. Annual maintenance costs typically increase as annual distance travelled increases, but given the lack of sensitivity of unit costs to maintenance, this has been ignored for the purposes of this study.

  We conclude that the use of unit costs for a representative vehicle in each Category introduces an acceptable degree of possible error. We address cost sensitivity in more detail in Section 5.3.

- Purchase costs and life expectancies have been taken from the current TfNSW panel and include for the provision of seatbelts for all bus categories.

- Overhead costs are taken as the mean of ‘Other’ costs as currently reported by operators, expressed as a per seat cost. This relationship appears to be reliable for operators with more than 100 seats, but the cost per seat increases in a logarithmic relationship as the number of seats reduces from there (Section 3.6).
- Return of capital (depreciation) is taken as a straight-line calculation using the nominal asset life, over the mandated maximum service life of the vehicle. The residual value of the vehicle has been ignored.
- Return on capital (cost of money) uses a WACC that was determined by IPART, and for unit costing purposes has been applied to the mid-point book value of the vehicle.

Table 5 Derived Unit Costs per vehicle

		Category 1 (Toyota HiAce Commuter)	Category 2 (Mitsubishi Rosa)	Category 3 (Hino BD190)	Category 4 (Mercedes O500)
Vehicle	Seats (Average of Panel Vehicles)	12	24	35	52
	Purchase Cost (2017 Panel)	[redacted]			
	Regulatory Asset Life (years)	15	15	25	25
	Fuel Consumption (litres / 100 km)	12.00	17.40	23.20	41.20
Route	Standard Annual Driving Time (hours)	760	900	920	920
	Standard Annual Distance Travelled (km)	28,000	32,000	30,000	30,000
Operator	Overhead per seat under contract	$700	$700	$700	$700
Derived Cost Rates	Maintenance Cost per km	$0.16	$0.08	$0.17	$0.15
	Fuel Cost per km	$0.15	$0.22	$0.30	$0.53
	Driver Cost per hour	$38.36	$38.36	$38.36	$38.36
	Return of Capital (annual)	$3,400	$9,267	$11,320	$14,560
	Return on Capital + Tax (annual)	$1,578	$4,300	$8,860	$11,395
	Overhead Allocation (annual, for > 100 seats)	$8,400	$16,800	$24,500	$36,400
	Total Cost per standard km	**$1.83**	**$2.33**	**$3.13**	**$3.93**

The unit costs shown in Table 5 have been applied to each current contract and route as follows:

- Maintenance and fuel are expressed as per km rates, and the total cost by route is calculated from the distance travelled.
- Return of capital and return on capital are annual costs (not unit costs).
- The driver unit cost is an hourly rate, which is multiplied by the assessed route driving time (allowing for sign-on and sign-off) to determine the annual cost (Figure 36).
- The overhead allocation is an annual cost driven by seat numbers, except for operators with less than 100 seats in total across all contracts. For those smaller operators, a formula has been used to increase the overhead provision per seat.
- A provision has been added for spare buses (10%).

This enables calculation of the efficient cost of operating the route, based on measured route parameters and standardised unit costs.

We report the two contract types separately in this section because adjustments have had to be made to the ‘B’ Contract analysis to adjust for the absence of data on distance travelled per route. The differences between unit costs derived for the two types of contract can be attributed to:

- Adjustments made to ‘B’ Contracts to adjust reported overhead and capital-related costs where the total distance travelled is not available (to derive a cost per km);
- The lower annual distances travelled per bus by B contracts when compared to ‘A’ Contracts, which also produces a difference in unit costs per km.

In addition, there may be opportunity for efficiency gains in driver rostering. This area is not included within the scope of this review.

Figure 36 Development of Driver Costs by Route km

Step	Component	Source / Approach
D	**Driver Route Costs**	
D.1	Total Driver Salary Cost	Input to the model and taken from Figure 20.
D.2	Number of trips per year	Route data analysed to identify the number of times each route operates on weekdays and weekends. The number of services per week are summed and extended to give the total number of trips per year.
D.3	Driver Hours per trip	The average scheduled trip duration is taken from the reported route data for each route. An assessment of the likely dead running time is added to each route. Allowances for the layover between trips and for shift sign on/off is added. Different allowances have been used for the A and the B contracts to recognise that the number of routes operated per shift is likely to be greater for the B contracts than for the A's. School services are assumed to be completed by casual staff, regular services by permanent staff. 2hr minimum shift length for casual staff is applied – noting that some school service drivers would in practice complete more than 1 trip per shift.
D.4	Annual driver hours	(Driver hours per trip) x (Number of trips per year)
D.5	Weekend and PH Working (B Contracts only)	For the B contracts only, a 'Weekend Multiplier' has been included to reflect the salary multipliers that are applied to Saturday, Sunday and PH working (1.5, 2 and 2.5 respectively). These apply to the Base labour rate only. The salary multipliers were weighted by the proportion of route minutes operated over the weekend from a review of route schedule data, with an assumed split in service between Saturday and Sunday. Public Holidays were assumed to operate as Sundays. The Weekend Multiplier was calculated as the ratio of driver hourly rate for weekend and PH work (i.e. including the weighted salary multiplier), to the driver hourly rate for weekday work (i.e. excluding the weighted salary multiplier) and reflects the proportion of weekend and PH route duration completed.
D.6	Annual Driver Cost	A Contracts: (Annual driver hours) x (Total Driver Salary cost) B Contracts: (Annual driver hours) x (Total Driver Salary cost) x (Weekend Multiplier)
E	**Route Distances**	
E.1	Annual Route Distance	Reported annual route distance as discussed in 4.1.
F	**Driver Unit Costs**	
F.1	Driver Cost / route km	The total annual cost of the driver is summed across all appropriate contracts and routes, and divided by the calculated total Annual Route Distance.

4.4 'A' Contract Costs assuming Efficient Route and Unit Costs

A comparison of the derived efficient costs for the delivery of the 'A' contracts compared to current contract costs on a per km basis in shown in Table 6, which shows the main cost elements side by side. It should be noted that the definition of the cost categories in the current contracts may not be consistently applied by operators, and may not relate closely to the cost categories used in the derivation of efficient unit costs. For example, the cost category 'Labour' may have been used by operators to include all labour, not just drivers. We therefore suggest that the line by line comparison of operating costs be taken as an indication only.

We have assumed that the 'Bus' cost category includes principal and interest payments on existing buses. It is important to note, however, that these financing costs are not directly comparable with our return of and on capital (including tax allowance). The total cost figures should be comparable, however.

Table 6 Contract costs and efficient costs for ‘A’ contracts, $FY16 (contract costs as average of the current contracted 5 year period)

Large Contracts						
Contract Reported km (million)	*1.97*	*AECOM Assessed km (million)*	*1.75*			*-11%*
Contract Cost per reported km		**Contract Cost per AECOM km**		**AECOM Cost per AECOM km**		***Difference***
Labour	$ 1.73	Labour	$ 1.95	Driver Cost	$ 1.03	
Fuel	$ 0.40	Fuel	$ 0.45	Fuel	$ 0.38	
				Maintenance Cost	$ 0.14	
Variable costs per km	$ 2.13	Variable costs per km	$ 2.40	Variable costs per km	$ 1.55	
Bus	$ 0.35	Bus	$ 0.39	Return on Capital	$ 0.24	
				Return of Capital	$ 0.33	
Other	$ 0.82	Other	$ 0.93	Overheads	$ 0.87	
Fixed costs allocated per km	$ 1.17	Fixed costs allocated per km	$ 1.32	Fixed costs allocated per km	$ 1.44	
Total Cost per km	**$ 3.30**	**Total Cost per km**	$ 3.72	**Total Cost per km**	**$ 2.99**	***-20%***
Medium Contracts						
Contract Reported km (million)	*7.52*	*AECOM Assessed km (million)*	*7.08*			*-6%*
Contract Cost per reported km		**Contract Cost per AECOM km**		**AECOM Cost per AECOM km**		
Labour	$ 1.83	Labour	$ 1.95	Driver Cost	$ 1.09	
Fuel	$ 0.41	Fuel	$ 0.44	Fuel	$ 0.43	
				Maintenance Cost	$ 0.15	
Variable costs per km	$ 2.25	Variable costs per km	$ 2.39	Variable costs per km	$ 1.67	
Bus	$ 0.50	Bus	$ 0.53	Return on Capital	$ 0.29	
				Return of Capital	$ 0.37	
Other	$ 0.92	Other	$ 0.98	Overheads	$ 1.04	
Fixed costs allocated per km	$ 1.42	Fixed costs allocated per km	$ 1.51	Fixed costs allocated per km	$ 1.70	
Total Cost per km	**$ 3.67**	**Total Cost per km**	$ 3.90	**Total Cost per km**	**$ 3.36**	***-14%***
Small Contracts						
Contract Reported km (million)	*17.03*	*AECOM Assessed km (million)*	*18.65*			*10%*
Contract Cost per reported km		**Contract Cost per AECOM km**		**AECOM Cost per AECOM km**		***Difference***
Labour	$ 2.16	Labour	$ 1.97	Driver Cost	$ 1.08	
Fuel	$ 0.48	Fuel	$ 0.43	Fuel	$ 0.42	
				Maintenance Cost	$ 0.14	
Variable costs per km	$ 2.63	Variable costs per km	$ 2.40	Variable costs per km	$ 1.64	
Bus	$ 0.59	Bus	$ 0.54	Return on Capital	$ 0.29	
				Return of Capital	$ 0.38	
Other	$ 1.09	Other	$ 0.99	Overheads	$ 1.02	
Fixed costs allocated per km	$ 1.68	Fixed costs allocated per km	$ 1.53	Fixed costs allocated per km	$ 1.68	
Total Cost per km	**$ 4.31**	**Total Cost per km**	$ 3.93	**Total Cost per km**	**$ 3.33**	***-15%***
Very Small Contracts						
Contract Reported km (million)	*24.96*	*AECOM Assessed km (million)*	*27.20*			*9%*
Contract Cost per reported km		**Contract Cost per AECOM km**		**AECOM Cost per AECOM km**		***Difference***
Labour	$ 2.06	Labour	$ 1.89	Driver Cost	$ 1.07	
Fuel	$ 0.41	Fuel	$ 0.38	Fuel	$ 0.37	
				Maintenance Cost	$ 0.14	
Variable costs per km	$ 2.47	Variable costs per km	$ 2.27	Variable costs per km	$ 1.58	
Bus	$ 0.57	Bus	$ 0.52	Return on Capital	$ 0.25	
				Return of Capital	$ 0.35	
Other	$ 0.97	Other	$ 0.89	Overheads	$ 0.82	
Fixed costs allocated per km	$ 1.54	Fixed costs allocated per km	$ 1.41	Fixed costs allocated per km	$ 1.41	
Total Cost per km	**$ 4.01**	**Total Cost per km**	$ 3.68	**Total Cost per km**	**$ 2.99**	***-19%***

These figures are based on the driver costs in Section 3.3. Should driver costs be based on the Award rates, the differences in Table 6 would increase by a further 4%.

We note that the majority of the ‘A’ contract services are reported to be running at high levels of bus utilisation, and the benefit of using more cost effective bus categories is minimal for these contracts.

The reported contract cost for all ‘A’ contract are approximately 21% greater than the calculated efficient cost (28% if Award driver rates were used).

The major contributor to this difference is route distance, where the reported distance across the ‘A’ contracts is approximately 11% greater than the measured, after allowing for deadruns and an allowance of another 10% above the measured distance to allow for off-route bus movements.

An analysis by contract shows that 43% of all ‘A’ contracts have a value more than 25% above the calculated efficient cost, the majority being Very Small contracts, and 2% have a value more than 25% less than the calculated efficient cost.

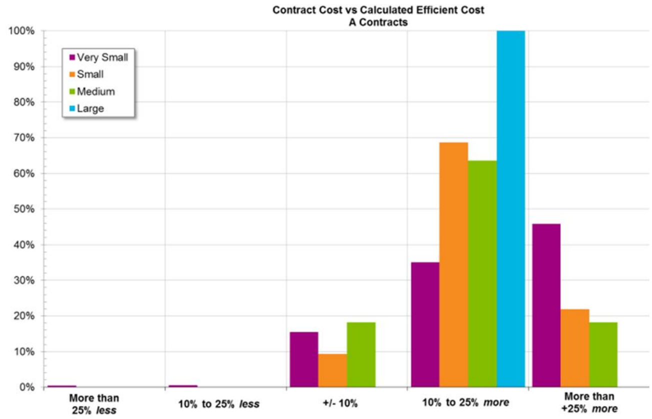


Figure 37 Reported Cost vs Calculated Efficient Cost by ‘A’ Contract

It should be noted that the contract costs may include higher operator margins than the return on capital provided via the WACC.

It should also be noted that there is a wide range of bus models in Categories 3 and 4, and the bus model selected as representative of Category 4 represents only 3% of the Category 4 fleet and was selected as representative of a low floor Category 4.

4.5 ‘B’ Contract Costs assuming Efficient Route and Unit Costs

A comparison of the derived efficient costs for the delivery of the ‘B’ contracts compared to current contract costs on a per km basis in shown in Table 7, which shows the main cost elements side by side. Not all routes included in the ‘B’ contracts have enough data to be used in a comparison of efficient and current contract costs, so the table compares the reported total contract cost with our estimate of efficient costs based on the subset of the ‘B’ contracts for which a full set of data exists.

There is no data to indicate how buses are allocated between school and regular routes, so it is not possible to identify specific capacity or costs associated with specific routes. We have therefore assumed an average cost for all buses operated in each contract, and allocated that equally to all routes using the number of trips (as a proxy for the probable number of buses per route).

The result is therefore that return of and on capital have been calculated for the fleet operator under each contract, and the average cost has been used on each route. This cost has then been turned into a unit cost where necessary using route length, the average number of seats per bus in the contract fleet, or the reported patronage for the route.

Route length has been taken from analysis of data sourced from TfNSW’s Open Data Hub, and a provision added for deadruns. Routes for which there is no distance data available (primarily for school services included in the ‘B’ set of contracts) have been ignored for the purpose of this comparison, and all costs adjusted in proportion to the number of trips by route (which is either known or assumed to be 2 for school routes).

The tables should be interpreted as discussed in the commentary on Table 6 above.

Table 7 Contract costs and efficient costs for 'B' contracts, $FY16 (contract costs as average of the current contracted 5 year period, where data available), without changes to buses used

Large Contracts				
Contract Reported km (million)	*10.82*			
Contract Cost per reported km		**AECOM Cost per AECOM km**		***Difference***
Labour	$ 2.97	Driver Cost	$ 1.41	
Fuel	$ 0.66	Fuel	$ 0.53	
		Maintenance Cost	$ 0.15	
Variable costs per km	$ 3.63	Variable costs per km	$ 2.09	
Bus	$ 0.65	Return on Capital	$ 0.28	
		Return of Capital	$ 0.37	
Other	$ 1.27	Overheads	$ 1.04	
Fixed costs allocated per km	$ 1.92	Fixed costs allocated per km	$ 1.70	
Total Cost per km	**$ 5.55**	**Total Cost per km**	**$ 3.79**	***-32%***

Medium Contracts				
Contract Reported km (million)	*20.93*			
Contract Cost per reported km		**AECOM Cost per AECOM km**		
Labour	$ 2.27	Driver Cost	$ 1.14	
Fuel	$ 0.53	Fuel	$ 0.46	
		Maintenance Cost	$ 0.16	
Variable costs per km	$ 2.80	Variable costs per km	$ 1.76	
Bus	$ 0.59	Return on Capital	$ 0.28	
		Return of Capital	$ 0.40	
Other	$ 1.14	Overheads	$ 1.18	
Fixed costs allocated per km	$ 1.72	Fixed costs allocated per km	$ 1.86	
Total Cost per km	**$ 4.52**	**Total Cost per km**	**$ 3.62**	***-20%***

These figures are based on the driver costs in Section 3.3. Should driver costs be based on the Award rates, the differences in Table 7 would increase by a further 4%.

The average utilisation for regular trips undertaken by 'B' contracts is just over 10%. Allowing for peak loads at double the average, there is clearly significant scope to reduce bus size and therefore operating cost (refer to Section 5.1). If all buses were to be downsized to a capacity more suitable for the reported patronage, the efficient costs would be significantly lower (Table 8).

Table 8 Contract costs and efficient costs for 'B' contracts, $FY16 (contract costs as average of the current contracted 5 year period, where data available), with efficient bus allocation

Large Contracts				
Contract Reported km (million)	*10.82*			
Contract Cost per reported km		**AECOM Cost per AECOM km**		***Difference***
Labour	$ 2.97	Driver Cost	$ 1.41	
Fuel	$ 0.66	Fuel	$ 0.19	
		Maintenance Cost	$ 0.15	
Variable costs per km	$ 3.63	Variable costs per km	$ 1.75	
Bus	$ 0.65	Return on Capital	$ 0.07	
		Return of Capital	$ 0.13	
Other	$ 1.27	Overheads	$ 1.04	
Fixed costs allocated per km	$ 1.92	Fixed costs allocated per km	$ 1.25	
Total Cost per km	**$ 5.55**	**Total Cost per km**	**$ 3.00**	***-46%***

Medium Contracts				
Contract Reported km (million)	*20.93*			
Contract Cost per reported km		**AECOM Cost per AECOM km**		
Labour	$ 2.27	Driver Cost	$ 1.14	
Fuel	$ 0.53	Fuel	$ 0.18	
		Maintenance Cost	$ 0.14	
Variable costs per km	$ 2.80	Variable costs per km	$ 1.46	
Bus	$ 0.59	Return on Capital	$ 0.07	
		Return of Capital	$ 0.13	
Other	$ 1.14	Overheads	$ 1.18	
Fixed costs allocated per km	$ 1.72	Fixed costs allocated per km	$ 1.38	
Total Cost per km	**$ 4.52**	**Total Cost per km**	**$ 2.85**	***-37%***

It should be noted that the analysis and presentation of results for the B set of contracts is currently limited to those routes for which a full data set is available (which includes regular service routes, but not school routes).

The reported contract cost for all 'B' contract sizes are approximately 48% greater than the calculated efficient cost.

The major contributor to this difference is the bus Category assumed to be used. A cost efficient operation would result in 59% of the regular routes served by 'B' contract operators using a smaller bus Category based on reported patronage (including an allowance for peak demand of twice average utilisation).

An analysis by contract shows that 53% of all 'B' contracts have a value more than 25% above the calculated efficient cost, and 7% have a value more than 25% less than the calculated efficient cost (Figure 38).

It should be noted that we have not included operator margin except via the WACC, whereas the contract cost includes margins.

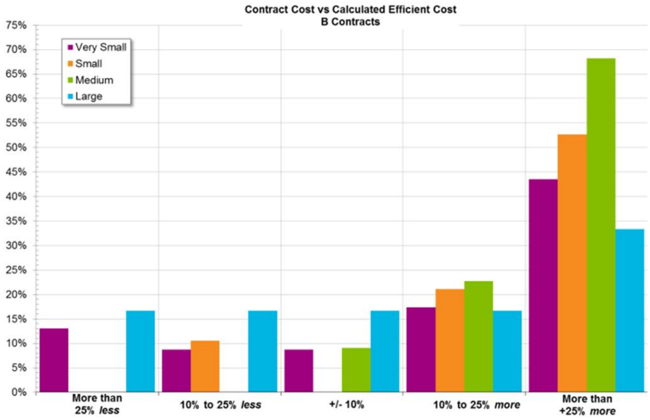


Figure 38 Reported Cost vs Calculated Efficient Cost by 'B' Contract (where data available)

4.6 Benchmarking

The derived unit costs have been compared with equivalent parameters from data sourced from other bus operating contracts as follows:

- Benchmark data A: Interstate data for a Medium sized operator but anticipated to represent efficient contract prices
- Benchmark data B: Interstate data for a range of contracts covering a very large number of buses anticipated to represent near efficient contract prices
- Benchmark data C: Outer Sydney Metro data for typically large operators
- Benchmark data D: International data set for bus and coach operators in the UK (sourced from the Confederation of Passenger Transport UK[11]) and averaged over FY12-16 for all UK regions. Whilst absolute costs are of limited benefit, it is considered valid to compare proportional cost allocations.

The results are presented in Table 9.

[11] http://cpt-uk.org/index.php?fuseaction=publications.public_briefing_list

Table 9 Benchmarking analysis

		Category 1 (Toyota HiAce	Category 2 (Mitsubishi Rosa)	Category 3 (Hino BD190)	Category 4 (Mercedes O500)	**Benchmark A**	**Benchmark B**	**Benchmark C**	**Benchmark D**
Direct Costs /km	Maintenance Cost per km	$0.16	$0.08	$0.17	$0.15	$0.37	$0.26	$0.51	
	Fuel Cost per km	$0.15	$0.22	$0.30	$0.53	$0.34	$0.41	$0.45	
	Driver Cost per hour	$38.36	$38.36	$38.36	$38.36	$37.80	$38.81	$56.82	
	Return of Capital (annual)	$3,400	$9,267	$11,320	$14,560			$40,063	
	Overhead Allocation (annual)	$8,400	$16,800	$24,500	$36,400				
Fixed Costs	Overhead per seat under contract	$700	$700	$700	$700	$389	$631	$2,333	
	Overhead (as markup on Direct Costs)	22%	38%	50%	65%	29%	19%	58%	
	Total Cost per km	**$1.83**	**$2.33**	**$3.13**	**$3.93**	**$5.34**	**$4.59**	**$5.01**	
Direct Costs	Maintenance Costs	9%	4%	6%	4%	9%	9%	10%	4%
	Fuel Costs	9%	10%	10%	15%	8%	14%	9%	17%
	Driver Costs	59%	49%	41%	33%	55%	55%	37%	44%
	Capital Recovery	7%	13%	13%	14%	N/A	N/A	11%	6%
Fixed Costs	Overhead proportion	17%	24%	29%	34%	27%	22%	33%	29%
TOTAL Costs		100%	100%	100%	100%	100%	100%	100%	100%

We conclude as follows:

Cost	Comment
Maintenance Cost per km	As proportion of total costs, the derived maintenance costs are in line with those from D, but lower as a proportion and in real terms that A, B and C. It is likely that these benchmark rates include costs associated with unscheduled maintenance (equipment failure, damage, vandalism, wear and tear etc). There is no clear basis on which to allow for this, however, the benchmark data suggests this could be a similar order to the scheduled maintenance costs (i.e. 4-6%).
Fuel Cost per km	There is good agreement between the derived fuel costs both in real values and as a proportion with the benchmarked data, particularly for the Cat 3 and 4 buses which are likely to make up the majority of the benchmark fleet.
Driver Cost per hour	There is excellent agreement between the derived labour costs both in real values and as a proportion with the benchmarked data.
Return on / of Capital	This is reported in the C and D benchmark data sets, which show different proportional allocations which could well be a result of the differing tax regimes. There is good agreement in proportional terms with the C data, but not in value. Differences are most likely due to variances in the age of the bus fleet (noting that in the model bus panel costs have been used), the tax regime, and the margin allocation – in our model this is included though the WACC calculation.
Overhead per seat under contract	There is good agreement with the per-seat overhead with the exception of the C data. This is most likely the result of inconsistent cost allocation reporting. As C operators are closer to metropolitan Sydney and are much larger organisations, typically covering an order of magnitude more annual kilometres than the rural and regional operators, we would expect a more substantial and expensive fixed cost base. There is insufficient data granularity to allow more rigorous investigation.
Overhead as a proportion of Direct Costs	There is good agreement with the overhead proportion, particularly with the Cat 3 and 4 buses which are likely to make up the majority of the benchmark fleet, where the derived costs range between 29-34% and the benchmark data between 22-29%.
Total Cost per km	The derived rates for the Cat 3 and 4 buses are about 20% below the benchmarked rates.

5.0 Efficient marginal costs

This section reviews the impact of marginal changes in distance run or passengers covered, in order to project probable future service delivery costs.

5.1 Bus capacity and utilisation

The change in contract cost when a bus Category is changed is shown in Figure 39, which superimposes the service cost on the curves previously presented in Figure 35 (using 'standard' annual bus costs for selected models representing each Category, as presented in Section 3.7).

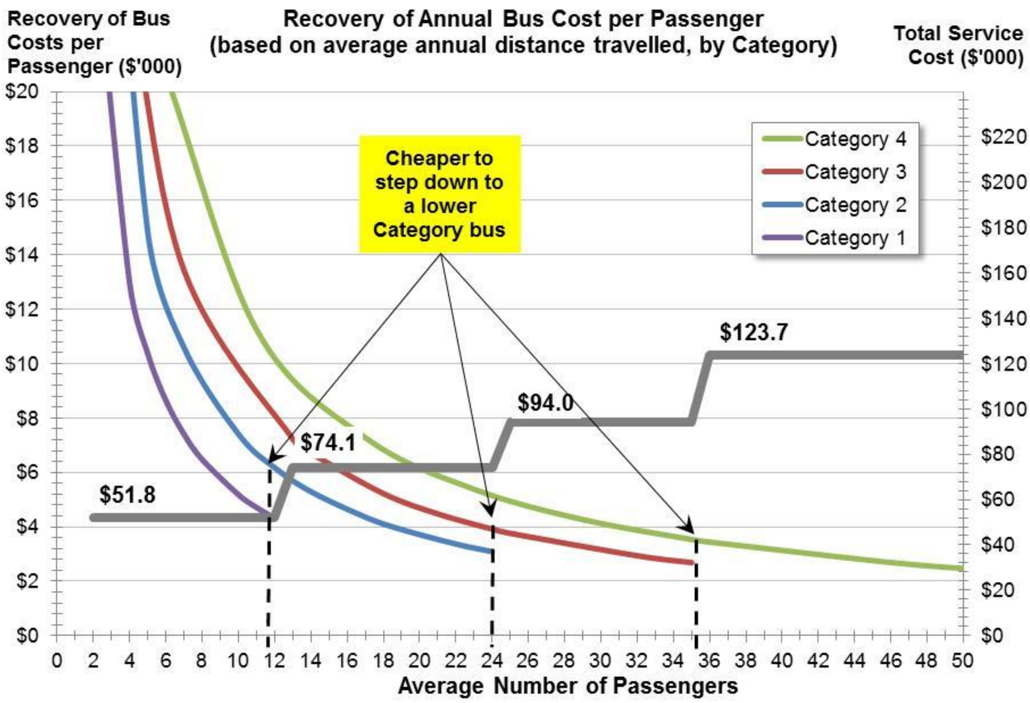


Figure 39 Change in service cost as bus Category changed

From the marginal cost point of view, it should be noted that there is no impact on total service cost until there needs to be a change in bus Category (or provision of an additional bus). When patronage (seats required) increases past the capacity of one bus or decreases enough to be accommodated with a smaller bus, a step up or step down in service cost is required, as indicated in Figure 39.

At the margin, for selected buses travelling at the average annual distance currently reported by operators for their Category, an increase by one passenger:

- From 12: forces an increase in annual service cost of $22,284
- From 24: forces an increase in annual service cost of $19,869
- From 35: forces an increase in annual service cost of $29,773.
- From full capacity of a Category 4 bus: forces an increase in annual service cost of either $93,973 or $123,747 for an additional Category 3 or 4 bus, depending on a prudent assessment of the trend of demand.

Other changes in passenger numbers have no impact on service costs. There will of course be a change in the per passenger cost, which would impact fare calculations. At the margin, one additional (or fewer) passenger that forces a change in bus Category would change service costs as noted.

In all cases, it makes strategic sense to increase to Category 4, and then to increase further using at least another Category 3. It never makes economic sense to add a second low Category bus in response to an increase in patronage.

The change in service cost noted above is based on the average annual distance travelled as reported by operators. The actual change depends on the annual distance travelled, as well as the Category involved. Figure 40 can be used to determine the actual marginal cost change per seat where a bus Category has to be adjusted to meet demand, depending on the annual distance travelled.

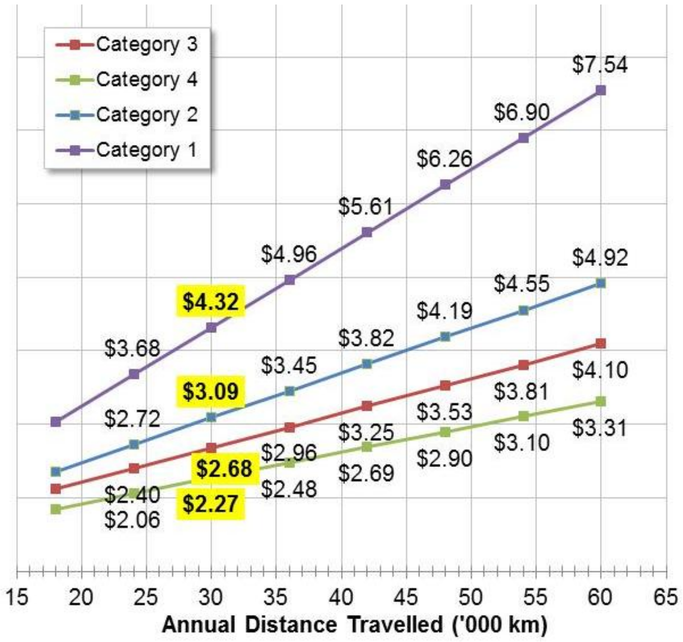


Figure 40 Adjustment to step changes for annual distance travelled

At the margin, the cost for one more or one less passenger is as indicated in Figure 41, where the dotted vertical lines indicates a change in bus Category and therefore in cost per passenger at that point (for vehicles travelling the standard annual distance of approximately 30,000 km).

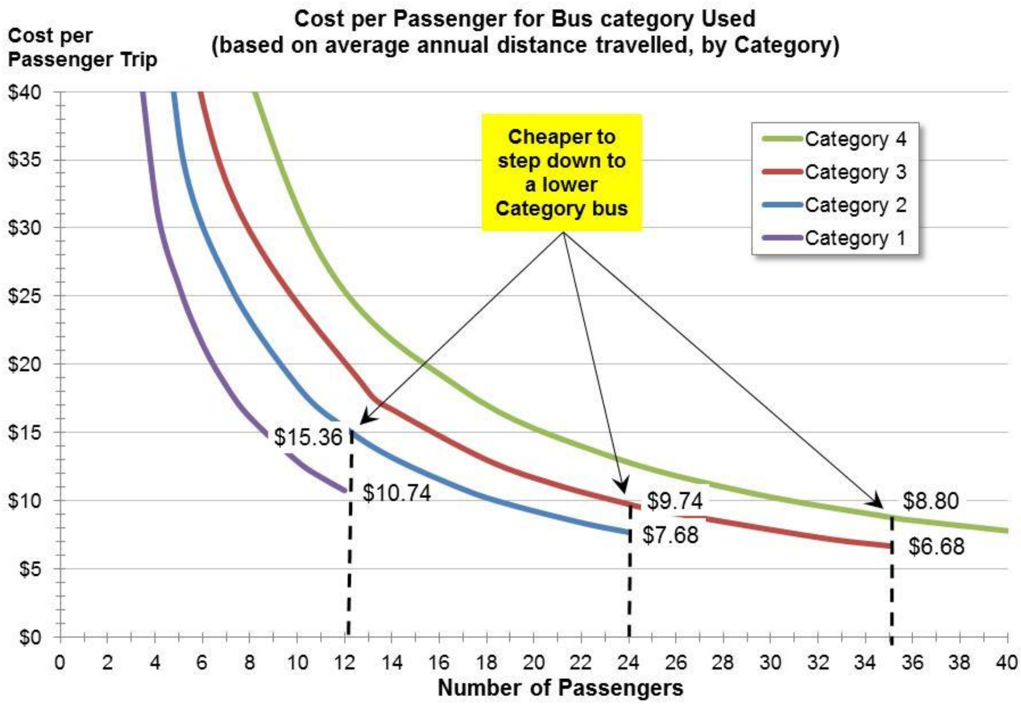


Figure 41 Marginal cost per passenger

An examination of current bus utilisation in ‘A’ contracts based on the total number of annual bus passes issued, identified 574 routes which could in principle have a larger or another bus for the route, and 141 routes which could have a smaller bus. This is likely to be an overestimate as in practice, only a proportion of those children with bus passes are likely to travel on the bus on any particular day. We have not had sight of any bus patronage data for these contracts to estimate this proportion. Most of these routes are School routes, and peak patronage is expected to be similar to the average patronage (although it will only apply for the last or first legs of the route depending on the direction of travel). Category 4 buses have standing capacity, and this has been taken into account.

We noted in Figure 16 that 50% of ‘B’ contract buses have an average utilisation of less than 10%. There will be peaks in demand for these services (at specific times of the day), which implies that outside those peak periods bus utilisation will be even lower. A relatively high proportion of these routes could be candidates for reducing the size of the bus being used, and therefore reducing operating costs.

These outcomes are shown in Figure 42, which shows the percentage of routes with a current Category of bus that would be changed to achieve optimal efficiency for each contract type.

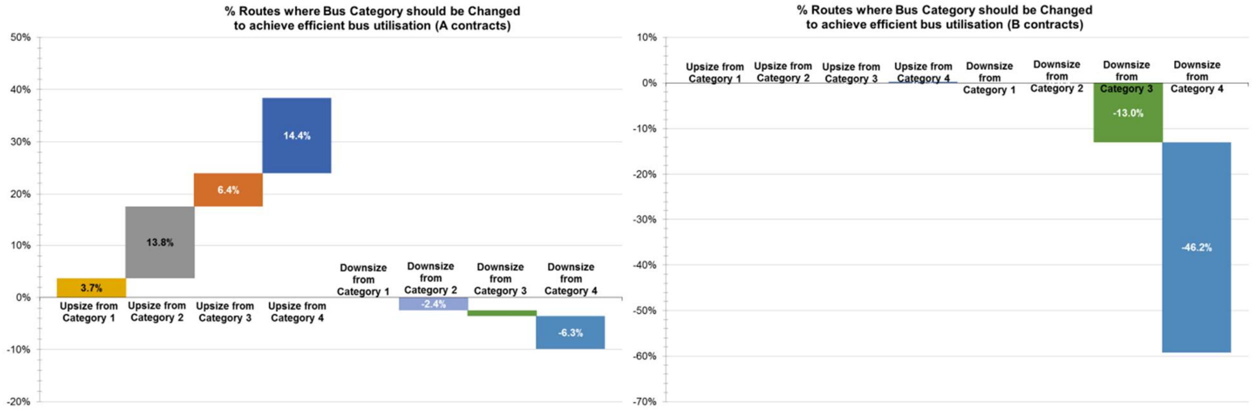


Figure 42 Changes Implied to Bus Categories currently in use for A and B contracts

The impact of downsizing on operator costs has been tested as case studies using two specific operators selected to be reasonably typical of Large and Medium operators with ‘B’ contracts (running both school and regular services).

Two options were modelled and the total annual cost calculated in exactly the same way as the business as usual cost:

1. Large buses retained for school services, smaller buses used for all other services.
2. Buses sized for regular services used for all services including school, meaning that two or more small buses are used instead of one large one for school services.

The modelling indicates that total costs for both operators evaluated would reduce to 62% of the current (business as usual) costs if strategy 1 were to be adopted. This would increase utilisation of the smaller buses to an average of 22% and 36% respectively, which would still accommodate regular peak demand.

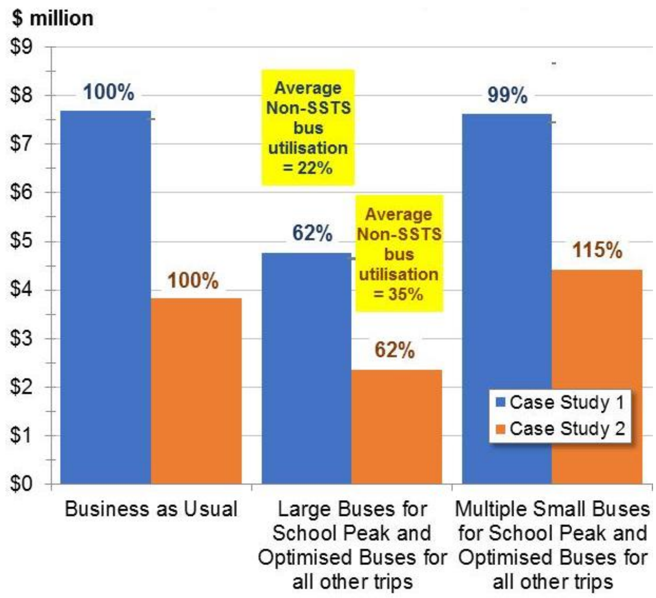


Figure 43 Impact of downsizing strategies on annual costs

5.2 Additional Distance

Marginal costs by distance travelled are easier to establish. Figure 34 presented unit costs by km for the representative buses in each Category, and showed that the calculated unit cost varies according to annual distance travelled (because the cost base includes some cost types that are time-based, not distance-based).

These unit costs can be summarised by annual distance travelled as shown in Figure 44, which includes four cost curves, one for the bus representing each Category.

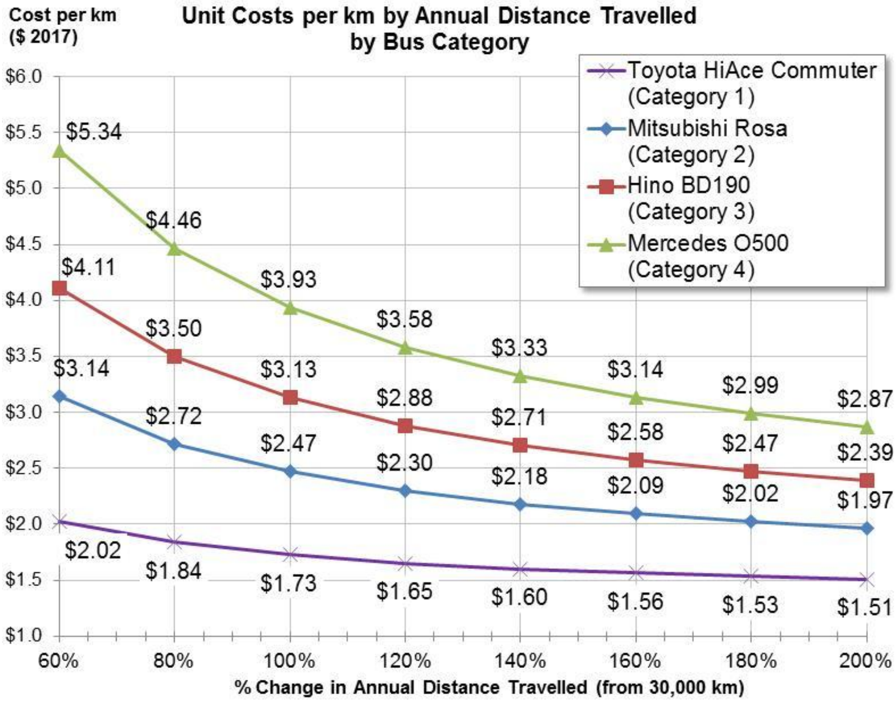


Figure 44 Unit costs by annual distance travelled

Although drivers are paid by time, in practice that payment reflects distance travelled via the speed of the bus – if the bus speed remains approximately the same but distance travelled increases, the driver cost will increase in relation to the increase in distance (ignoring shift length components of the award).

5.3 Projection to 2022

We have not attempted to assess demand projections or to make our own for rural and regional bus services. We are able, however, to model the impact on service (contract) cost for a range of possible demand scenarios.

The more complex scenarios involve changes in patronage but not distance travelled or time driven. As noted in Section 5.1, the cost of providing the service does not change materially as patronage changes, until the change is significant enough to require a change in bus Category. In practice, for most operators, the ability to change the bus depends on approval from TfNSW and the time required to effect the change once approved.

We have noted that a proportion of routes are currently operating with less than optimal bus sizes (Figure 42). Changes in demand will have an impact on route utilisation, and the number of routes operating with a sub-optimal bus size is likely to change.

A change in service cost as a result of changes in demand will only occur if a larger / smaller bus is required, or if a second bus is needed for the route. The impact on total service costs of various rates of change in demand are shown in Figure 45.

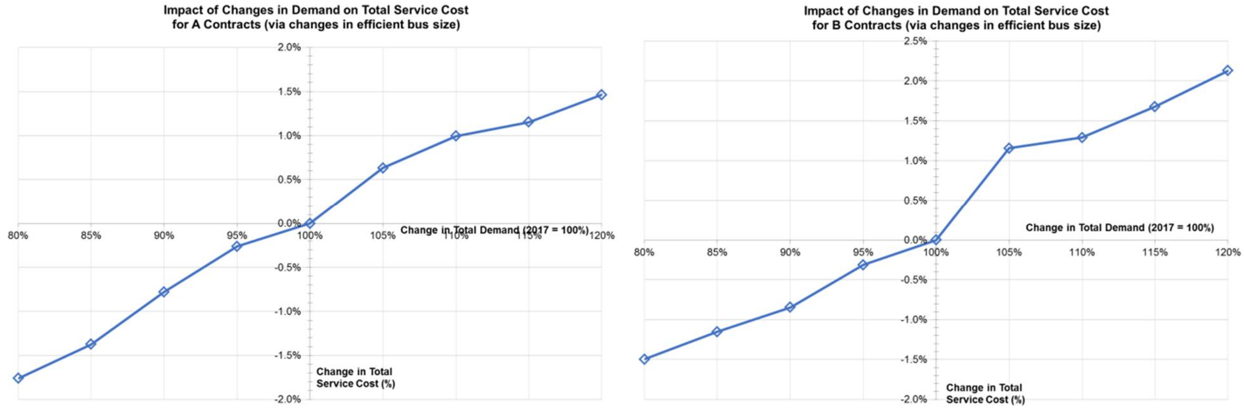


Figure 45 Impact of changes in demand on service costs for A and B contracts

The analysis indicates that an increase in demand by 5% is likely to cause an increase in total service cost across all current rural and regional routes of about 0.8%, and a similar reduction in demand would reduce total service costs by about 0.2%.

6.0 Scope for flexible transport solutions

6.1 Definition

Flexible transport or Demand-Responsive Transport (DRT) is a broad term referring to non-fixed Public Transport routes or services. It encompasses a wide range of services which have been running for over 40 years worldwide.

Historically, flexible transport services have mainly been used complementary to regular PT services for either:

- Users with specific needs, mainly health and social needs. The majority of customers are elders, people with a disability, underages or low-income citizens who cannot afford car-ownership. When the service is design to suit specific customers, it is referred to as a “community transport” service; or
- Users living in remote areas with no access to other public transport services.

The basic principle of flexible transport is that the service runs only if a booking has been made in advance. Therefore, flexible transport solutions are often considered to provide a more cost-effective transport service for areas where demand is low or irregular as no empty vehicles operate.

6.1.1 Key characteristics

Flexible transport can be implemented in many different ways depending on the needs to address, the geography and density of the area to serve, the habits of potential users, the level of subsidies, etc.

Flexible transport services are usually defined according to the following elements:

- Passenger pick-up and drop-off (door to door or at identified stops)
- Route (fixed or not)
- Time (fixed timetable or adaptation to the customer’s request)
- Booking (from 1h to 24h in advance)
- Booking platform (phone, online, agency, app)
- Customers (everybody, disabled and elders, living in remote areas, young)
- Vehicles (mini buses variable size, taxis)
- Operation times (everyday, shared between several areas, only during the daytime)

Generally, the service is built to answer the specific need of a territory or a community. One of the major criteria in the design of the service is the population density. Three operation environments are commonly identified: rural areas, small urban areas and, large urban and suburban areas.

6.1.2 Technology offers new opportunities for flexible transport

Until recently, flexible transport solutions have mainly been addressing the need of captive users, who do not enjoy other travel options. However, the development of new technologies dedicated to new mobility are changing the way flexible transport can be integrated in the city. Innovative and alternative solutions are flourishing such as car sharing, driverless vehicles, the use of smartphones and apps, etc. Transport for NSW requested Expressions of Interest early in 2017 for transport industry partners to develop innovative ideas related to how public transport mobility could be improved by technology, and noted four main reasons to focus on flexible transport (Figure 46).[12] The principal aim is to provide greater flexibility and mobility in the transport offering.

[12] Extract from On-Demand RFEOI industry Briefing 14/12/2016. TfNSW

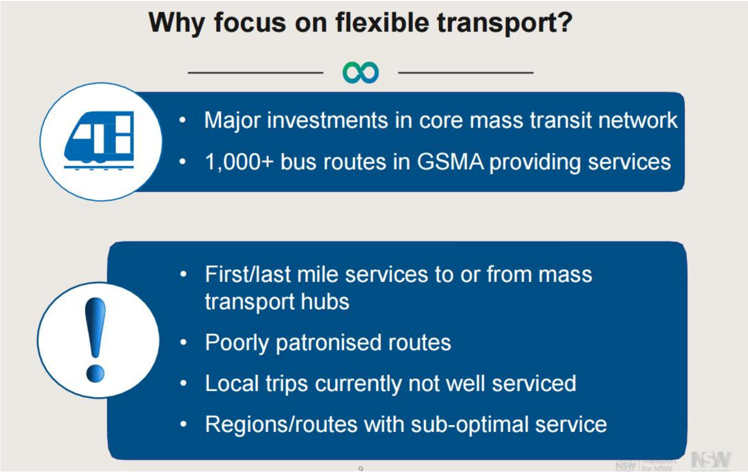


Figure 46 Why focus on flexible transport?

The image of flexible transport is evolving, as well as its potential usage. The On-Demand Pilots should be realised to the market during the second semester of 2017.

In this section, we will focus on existing and widely implemented flexible transport solutions relevant to apply in a rural and regional context.

6.2 Benchmarking on flexible transport services

6.2.1 Flexible transport service types

Based on international benchmarking (UK, US and French examples), flexible public transportation options can be categorized as six service types[13].

1. Route Deviation: the vehicle operates along a defined corridor with a regular schedule. Bus stops can be marked and the vehicle can deviate to serve demand-responsive requests within an area around the planned route. The deviation-zone may or may not be strictly bounded. This service type is most effective in areas with sufficient density to support a defined path and schedule but could benefit from the flexibility of serving origins and destinations that are otherwise off-route.
2. Point Deviation: the vehicle operates within a defined zone with or without identified stops, the path between the stops is optimized for each trip and the vehicle serves locations within the zone on request. Point Deviation can be most effective for a service that identifies specific trip destinations but dispersed origins, or vice-versa.
3. Demand-Responsive Connector: the service operates as a feeder to a fixed PT system (a train station for example). It is demand-responsive and connects remote areas to better-served neighbourhoods. The demand-responsive Connector is often used when there are spread origins but a common destination.
4. Request Stops: similar to route deviation, the vehicle operates along a defined route with a regular schedule. Fixed stops are identified but the service can deviate from the route to stop at different stops, based on passengers' requests.
5. Flexible-Route Segments: the service is based on a scheduled fixed route with identified sections operated on-demand.
6. Zone Route: Demand-responsive service with fixed departure and arrival times but no specific route.

[13] Transit Cooperative Research Program (TCRP) - TCRP synthesis 53. Operational Experiences with flexible Transit Services. 2004

6.2.2 Pros and cons of flexible transport in a rural and regional environment

	Pros	Cons
For passengers	Promotion of mobility for less mobile persons (elders, disabled, living in remote areas) – social inclusion	Variation in the level of flexibility from one system to the other
	Adaptation to specific needs (personalized service)	Booking in advance required
	Provision of affordable transport even in remote areas	Low time sensitivity
	Can offer door to door service	Fare sometimes more expensive than a regular service (depending on the government policy) Registration to the service often asked for
For operators	Fewer non-commercial kms as routes are optimized and adapted to the demand. Lower maintenance and fuel costs	Availability of drivers and vehicles in case the service has to run (the impact depends on the book in advance time slot)
	Better penetration (if lower bus categories are used which can access narrower streets and thus offer a better service)	More expensive per passenger cost
	Opportunity to gain new customers	
For government	Opportunity to work collaboratively with the taxi industry or other P2P style services.	Higher per passenger costs – requires higher subsidy per passenger trip than regular transport

6.2.3 Costs

The cost of demand-responsive transport varies a lot depending on the characteristics of the service. As for fixed route services, the cost of running the vehicles is the primary cost. Additional costs have to be taken into account including the booking and dispatching management system and the availability of vehicles and drivers to answer a potential request. It appears that the fixed costs (i.e. non-kilometre related costs) vary according to how much in advance the booking has to be made. According to international experiences[14], it is considered that these fixed costs represent about:

- 80% of the cost of a fixed route, if the booking can be made up to 30 or 60 minutes in advance;
- 40 to 50% of the cost of a fixed route, if the booking has to be made the day before.

It appears that the economic contingency can be minimized if the service is entrusted to a taxi company.

The booking management and dispatching system represents a major fixed cost for the DRT service. Depending on the size of the area and the fleet, it can be different from one system to the other:

- For small operators offering a service with a little number of routes and vehicles and limited times of operation: a phone booking system with a physical person answering the phone and organizing the bookings is usually sufficient to cope with the demand.
- For bigger operators, with more flexible services and a larger fleet: a phone or online automatic booking system is usually recommended.
- For major operators, offering multiple services, real-time booking and managing a large fleet: app-based booking and dispatching systems which can also provide passenger information are being developed.

The cost highly depends on the need and the automatization required. For the first category, the cost represents the salary of the operator as no specific software is used. For the third one, costs can rise up to several hundred thousand AUD.

[14] DATAR / DTT / ADEME – Services à la demande et transports innovants en milieu rural: de l'inventaire à la valorisation des expériences. Final report. ADETEC Nov 2004.

6.3 Examples

As presented earlier, many different services can be implemented, resulting in different level of services, level of flexibility and costs. We summarise three flexible transport options.

<table>
<tr><th>Type of DRT</th><th>How does it work?</th><th>Relevance</th></tr>
<tr><td rowspan="2">Option 1: Virtual fixed route</td><td>The vehicle operates along a fixed route only if a booking is made. Customers board the vehicles at identified stops and the route is then adapted to collect all booked passengers and optimize the kms travelled.</td><td>· Relevant where the level of demand is low but concentrated on a corridor.</td></tr>
<tr><td colspan="2">The operator fixes a route in the area of service. Depending on the size of the area and the population to serve (general public or people with specific needs), the route can run along a linear corridor or have stops spread over the area in order to make sure that potential users do not have to walk long distances to get to the stop.
The timetable is fixed, for example to one service per hour. Customers have to book in advance by calling the booking operator. If no booking is made, the service does not run. If customers have to book one day in advance, at the end of the previous day, the booking operator allocates vehicles to the services to perform.
The route is optimized to pick all passengers in the most efficient way in order to save time and limit unproductive kilometres.
This option is cost-efficient for three main reasons:
The need for drivers is known in advance.
The kilometres travelled cannot differ much from one trip to the other as passengers are picked up from an identified stop.
The number of passengers per trip is potentially higher as timetables are fixed.</td></tr>
<tr><td rowspan="2">Option 2: Door to fixed destination, fixed /no fixed timetable</td><td>Pick-up at home and fixed destinations (shopping centre, hospital, major transport hub, etc.)

Time of service set according to the customer need and availability of vehicles</td><td>· Relevant for occasional trips
· Relevant in rural and regional areas. Often used as feeder to regular routes or train station.
· Good quality of service for an average running cost. Destinations and schedule to adapt according to the demand.</td></tr>
<tr><td colspan="2">The operator identifies key destinations in the area: hospital, shopping mall, train station. The timetable is not fixed but customers should not be too sensitive to time as the vehicle has to pick them up at home. The travel time would be longer than on a fixed route.
The vehicle does not follow a route; the driver adjusts the route to be the shortest between the pick-up locations and toward the final destination. This option is adapted to all users as they don't have to walk to the bus stop. Customers have to book in advance through a booking platform. If no booking is made, the service does not run.
If passengers can book up to one hour in advance, then drivers and vehicles have to be available. The size of the fleet needs to be adapted to estimated needs in order to be cost-efficient. This option appears more flexible because the pick-up location and time are chosen by the customer. However, it can be less demand-responsive to customers in the case that all vehicles are already in service and their trip cannot be performed due to unavailability of resources.
This option is more expensive than Option 1 for three main reasons:
Drivers have to be available at any time due to a short advance booking time slot
The kilometres travelled can be fairly different from one trip to the other depending on the size of the covered area.
The booking management system may have to be more sophisticated (and more expensive) depending on the size of the area to cover and the potential short notice time slot.</td></tr>
<tr><td>Option 3: Door to door, no fixed</td><td>Close to taxi service: destination and pick-up time adapted to each customer. Customer has to respect the book in advance time slot.</td><td>· Expensive solution. Potential conflict with taxi industry.
· Optimisation: to narrow the reservation time slot.</td></tr>
</table>

Type of DRT	How does it work?	Relevance
timetable	The operator does not fix routes or stops, or timetables. This service is similar to a taxi service with the difference that it still has to be booked in advance to operate. This service is adapted to specific needs of users and ride sharing opportunities are less convenient. As with Option 2, the quality of the service depends on the availability of drivers and vehicles. That is why it is important to find the best compromise in the advance booking allocated time; too long in advance does not satisfy last minute queries and too close to the departure time represent high costs and a potential lack of availability. This option is more expensive than Options 1 and 2 for four main reasons: Drivers have to be available at any time due to a short advance booking time slot; The kilometres travelled can be different from one trip to the other depending on the size of the covered area; The booking management system may have to be more sophisticated (and more expensive) depending on the size of the area to cover and the potential short notice time slot; The potential for ride sharing is low (the probability of compatible needs at the same time is low).	

6.4 Key lessons learnt

A lot of literature exists on flexible transport. Several comparative analyses have been performed. From these experiences, key lessons can be highlighted and kept in mind for the development of flexible transport rural and regional NSW:

- Many different solutions are implemented across the world, with different levels of flexibility regarding pick-up locations, timetables, book in advance timing, etc.
- There is no perfect solution. The choice relies on several criteria (urban density, geography, existing regular PT network, purpose of the service) and has to be made on a case-by-case basis.
- To be efficient, the service should be defined in collaboration with potential users in order to meet their needs (destinations, virtual routes). As it is demand-responsive, it has to reflect the actual demand to be effective. Fixed transport, however, are usually designed as the compromise to satisfy the largest number of users; it generally runs where the density is higher.
- The image of the service to the general public can be improved. People often think that they are not eligible to the service. It is mainly seen as a community service for elders, disabled, children, etc. However, new flexible options are emerging (Uber-type) thanks to technology; the perception of the service is already changing.
- It is difficult to establish unit costs for flexible transport as the kilometres travelled vary and consequently the km-related costs: fuel costs, maintenance costs.
- Flexible transport services have lower non-commercial costs as the service runs only if a booking is made in advance. However, the cost per passenger is usually much higher.
- Depending on the book in advance time slot, drivers have to be available in case the service is booked. They are considered as fixed costs for the system.

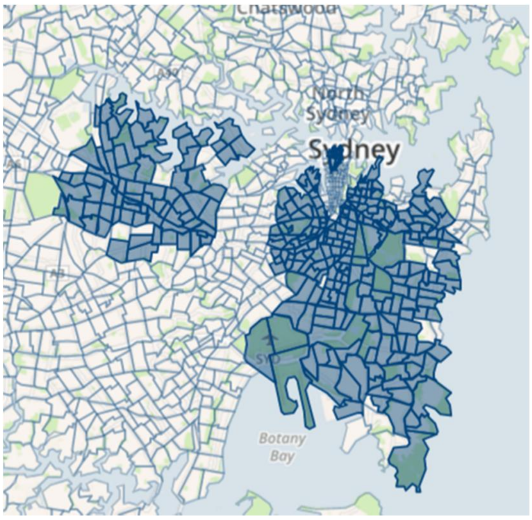
6.5 Focus on community transport

Transport is of critical importance to our lives as it allows us to fulfil simple day-to-day needs (health or social related activities). Going to the doctors, doing some shopping or visiting relatives or events are activities that we should all be able to enjoy regardless of our age, condition, wealth and place of residence. Most people have access to one or several forms of transport: private car, public transport, or active transport. However for some people, mobility can be a real challenge. A disability, an illness or simply the lack of other transport option can affect personal wellbeing and create social exclusion.

Community transport is a form of flexible transport specifically implemented to answer the needs of people subject to suffer from social exclusion. It represents a solution for them as they can benefit from a personalized service at an affordable price.

Community transport is usually a door-to-door service as it targets people with mobility matters. It is usually a non for profit service, funded by the government.

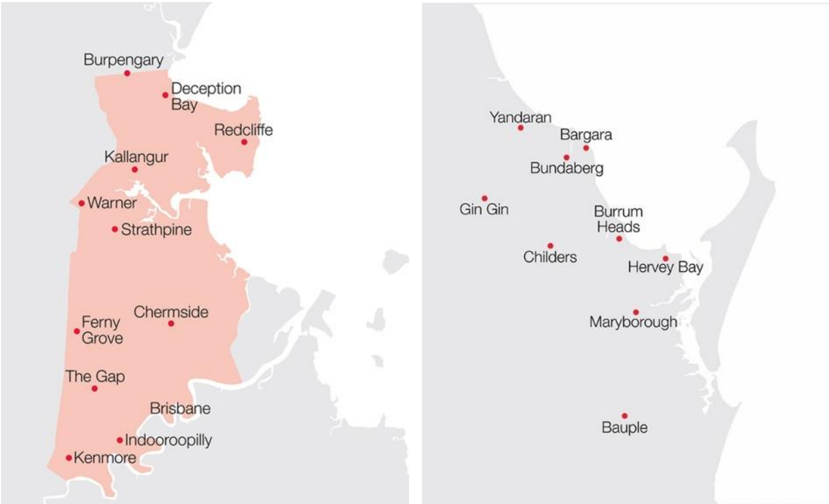
To understand how community services are currently run in Australia, we review four existing service providers:

Access Sydney Community Transport (ASCT)	
History	ASCT was formed in 2015 after a merger between SESCT (provided service for more than 35 years) and IWCT (more than 30 years of services).
Areas covered	Most councils of the Inner city, Inner West, South East and East Sydney, total around 80 councils. 
Target Market	People who are elderly, frail, or have an illness or disability that makes ordinary transport difficult. Services are designed to assist people who don't or can't drive, cannot arrange transport through a friend or relative, can't use public transport or afford ordinary transport.
Service Description	Door to door services. Operating from Monday to Friday, with flexible timetable (booked in advance). · Individual transport: - Health related transport: 6.30am-4pm. Requests 2 working days in advance. - Social access transport: 8.30am-4pm · Group transport: - The Shopping Bus: ASCT clients are transported to local shopping centres with assistance provided on and off the vehicles as required. - Social Outings: group excursions organised by ASCT - Assisted Shopping: for clients with limited mobility who require assistance while they are at the shopping centre. Fortnightly service.
Fleet	Fleet of 11 buses, 9 mini buses and 7 cars. Contract with TfNSW states that any vehicle that has been purchased with their funding must be returned if the organisation ceases its operations.
Drivers	Paid drivers
Fares	· Shopping: $5 · Social Outings: $10 · Assisted shopping: $8
Booking system	Mandatory registration to be in the client data base or use through my Aged Care Registration for Social Outings by phone

Access Sydney Community Transport (ASCT)	
Subsidies and cost of the service	Clients pay a contribution of $5 per round trip, for a service subsidised $30/one way trip. Clients fund only 5.6% of the cost of the service New contract with the government states that services must aim to generate a minimum 15% of the contract funding from client contributions (currently 5.6% for ASCT) ASCT implements a strategy to increase fare revenue (small increase to fare every 9 months) but some of the clients then move to other services that are free (such as City of Sydney's Village to Village) Total annual expenditure = $4.3 million. 140,703 trips and 13,947 hours of social support were provided by ASCT
Funders	· TFNSW (Commonwealth Home Support Programme – Transport) · NSW Department of Family & Community Services – Transport (NSW Community Transport Programme) · The Commonwealth Department of Social Services (Social Support for Older People) · NSW Department of Family and Community Services (Social Support for Younger People with Disabilities) · City of Sydney Council (Village to Village Shuttle Bus) · NSW Department of Health (Health Related Transport Grant)
Website	For more information, visit http://accesssydney.org.au/#

Qcity Transit On-demand services	
History	Operation started in the 1990's
Areas covered	Queanbeyan and Bungendore areas
Target Market	No specific requirement to be allowed to use the service.
Service Description	Two on-demand routes are in service in the Queanbeyan and Bungendore areas (routes 840 and 850). The services operate from Monday to Friday, starting at the timetabled locations and then traveling as requested within the Queanbeyan area. Passengers must advise the driver of their destination upon boarding.
Vehicles	No data on the vehicles specifically used for routes 840 and 850. Qcity Transit operate a fleet of standard buses (Volvo 53 – 61 seats)
Drivers	Paid drivers
Fares	Full fare $4.00 one way, Concession $2.00 one way
Booking system	Customers have to book by phone, the day before they intend to travel.
Subsidies and cost of the service	No data available online
Funders	No data available online
Website	For more information, visit http://qcitytransit.com.au/

Note: Since there is no constraint on use of the service for customers (such as age, health status), the Qcity Transit On-demand services should not be qualified as Community Transport - it is a Demand-Responsive Transport service.

St John Ambulance Australia – access direct service	
History	Unknown
Areas covered	Access Direct transport services are available to eligible people living in the greater north Brisbane, Pine Rivers and Redcliffe areas, as well as Bundaberg, Maryborough, Hervey Bay and surrounding areas. 
Target Market	People aged over 65 (or people aged over 50 if Aboriginal or Torres Strait Islander), people with a disability and their carers who have difficulty using public transport or accessing a private vehicle.
Service Description	A pre-booked door-to-door service that provides transport to health facilities, rehabilitation and social activities for individuals or small groups. St John offers transport to: · Medical appointments, church or special events · Your local shopping centre · Social outings and activities with your friends · Brisbane hospitals from regional areas St John shopping trips offer community Transport services from home to identified shopping centres from Monday to Friday following a timetable
Vehicles	No data available online
Drivers	28 Volunteer drivers
Fares	$3.00 each way for St John shopping trips
Booking system	The service operates on a 'book in advance' basis and requires clients to be medically fit for transport by community transport support workers. All clients must be registered with St John Ambulance before transport can be arranged.
Subsidies and cost of the service	The cost of each transport trip depends on the number of kilometres travelled and if the client is eligible to receive subsidised transport funding from Queensland Community Care Services or Home and Community Care Services. Over 98,000 trips and 543,000 kilometres travelled in 2014. + 2000 new clients in 2014
Funders	St John Ambulance (Qld) relies on the support of local communities, companies and government agencies.
Website	For more information, visit https://www.stjohnqld.com.au/Services/Social-Services/Community-Transport-Options/Access-Direct
TransComCare	

St John Ambulance Australia – access direct service	
History	TransComCare is a Community Transport service provided by the Hervey Bay Neighbourhood Centre (founded in 1985). It started with a team of volunteers providing the Women's Information Service and Neighbourhood Activity group out of Hervey Bay's Memorial Hall and evolved in order to answer broader needs of the community including community transport. TransComCare was created in the 1990's.
Area covered	Hervey Bay local district
Target Market	To be eligible a person must meet all following criteria: · Be eligible for the Commonwealth Home Support Program (CHSP) or Queensland Community Care (QCC) Program. · Be a resident of Hervey Bay · Be a person who is frail, aged, disabled (temporary or permanent) · Be living at home · Find it difficult to use public transport or have no other means of transport · Do not have a current drivers licence · Be a carer of a person who is frail, aged, disabled (temporary or permanent).
Service Description	A pre-booked door-to-door service running from Monday to Friday. The service is available to take clients to doctors, dentists, hospital appointments, shopping and to social activities. Clients are asked to be ready 30 minutes prior the agreed pick-up time. Clients are entitled to have two trips per week with TransComCare.
Vehicles	Bus or cars
Drivers	The drivers of TransComCare come from a pool of volunteers of the Hervey Bay Neighbourhood Centre. To be a driver, volunteers will: · Have an induction process where they will be skilled on being a driver. In addition it is a requirement that each driver · Have to obtain a Drivers Authorisation Licence within six months of commencing. The driver will receive support and monitoring of their work.
Fares	Clients are expected to make a donation for the service. In case of financial difficulty, the payment can be negotiated.
Booking system	Customers need to book in advance by telephone (free call) giving at least 3 working days' notice prior their transport needs.
Subsidies and cost of the service	No data available online
Funders	· Australian Government Commonwealth Home Support Program, and; · Queensland Government Community Care Program
Website	For more information, visit http://www.hbnc.net.au/hb/index.php/en/programs/aged-and-disability-services/transcomcare

Currently, Community Transport operators are funded by government to provide the service. They receive a subsidy per client per trip. However, in the future, government may fund clients instead of organisations, and community transport providers will need to adapt to this evolution. For example, the National Disability Insurance Scheme provides eligible people with a transport subsidy of $1539 per annum. This subsidy would not allow targeted users to travel with community transport as they were used to.

Therefore it is possible that community transport providers will be in competition with taxis/Uber for some of the trips they currently provide.

6.6 Conclusions

These examples show that flexible transport options provide a different and perhaps higher level of service to a smaller client base, but generally at a higher cost than fixed, traditional bus services.

Smaller bus Categories are most likely to be used for this service. As the cost of the driver is more significant for these smaller flexibility in terms of route may not be a cost-effective solution.

Flexibility in terms of trips on relatively stable routes will, however, provide a cost advantage and opportunities to develop this concept could be pursued.

7.0 Findings and conclusions

7.1 Efficient operating costs

We have derived estimates of efficient unit costs for rural and regional bus services provided in NSW, based on:

- Return of and on capital using current TfNSW panel rates and service life expectancies, and a WACC provided by IPART;
- Route length and driver times estimated from spatial data provided by TfNSW, allowing for deadruns and / or layovers;
- Driver costs using current EA rates applied to route driving duration estimates, allowing for sign-on and sign-off, and including deadrun driving time and / or layover time;
- Fuel costs based on manufacturers recommendations;
- Maintenance costs based on manufacturer or dealer recommendations, with cost estimates made by our internal cost assessors;
- An allocation of overhead to each route or bus using the mean of overhead per seat among all contracts (this ratio being the best correlation found of overhead to an operational factor, in the absence of any details of overhead costs that could be reviewed).

Our assessment of the efficient unit costs for operating buses is shown in Table 10, which is based on the annual driving time and distance travelled shown in the Route section.

Table 10 Unit costs by TfNSW bus Category

		Category 1 (Toyota HiAce Commuter)	Category 2 (Mitsubishi Rosa)	Category 3 (Hino BD190)	Category 4 (Mercedes O500)
Vehicle	Seats (Average of Panel Vehicles)	12	24	35	52
	Purchase Cost (2017 Panel)	[redacted]			
	Regulatory Asset Life (years)	15	15	25	25
	Fuel Consumption (litres / 100 km)	12.00	17.40	23.20	41.20
Route	Standard Annual Driving Time (hours)	760	900	920	920
	Standard Annual Distance Travelled (km)	28,000	32,000	30,000	30,000
Operator	Overhead per seat under contract	$700	$700	$700	$700
Derived Cost Rates	Maintenance Cost per km	$0.16	$0.08	$0.17	$0.15
	Fuel Cost per km	$0.15	$0.22	$0.30	$0.53
	Driver Cost per hour	$38.36	$38.36	$38.36	$38.36
	Return of Capital (annual)	$3,400	$9,267	$11,320	$14,560
	Return on Capital + Tax (annual)	$1,578	$4,300	$8,860	$11,395
	Overhead Allocation (annual, for > 100 seats)	$8,400	$16,800	$24,500	$36,400
	Total Cost per standard km	**$1.83**	**$2.33**	**$3.13**	**$3.93**

The standardised unit costs have been applied to all routes to determine an efficient cost for each route (using the measured route length including deadrun, and the estimated driving time based on the schedule with allowance for deadruns and / or layovers and sign-on / sign-off provisions.

The derived efficient cost for operating each ‘A’ contract route compares well *on average* with current contract cost, but less well for ‘B’ contracts for reasons noted below.

There are a number of contracts that appear to be significant outliers from the mean. These are possible candidates for review by TfNSW in order to realise efficiency gains.

Possible reasons for variations from the mean on a route by route basis include:

- Differences between reported route lengths and measured lengths;
- Differences between reported driving time and our estimate;
- Use of a large bus where a lower Category bus would be able to provide the service required;
- Differences in overhead structures from the mean for rural and regional bus services (which could range from operators not including some costs in their reported totals, to others who include, for example, abnormally high depot-related costs).

It should be noted that rural buses have a very light duty factor when compared to urban buses, and the unit costs reflect that.

7.2 Efficient marginal costs

Marginal costs have been derived and presented on a *per km* and a *per seat* basis (Figure 47).

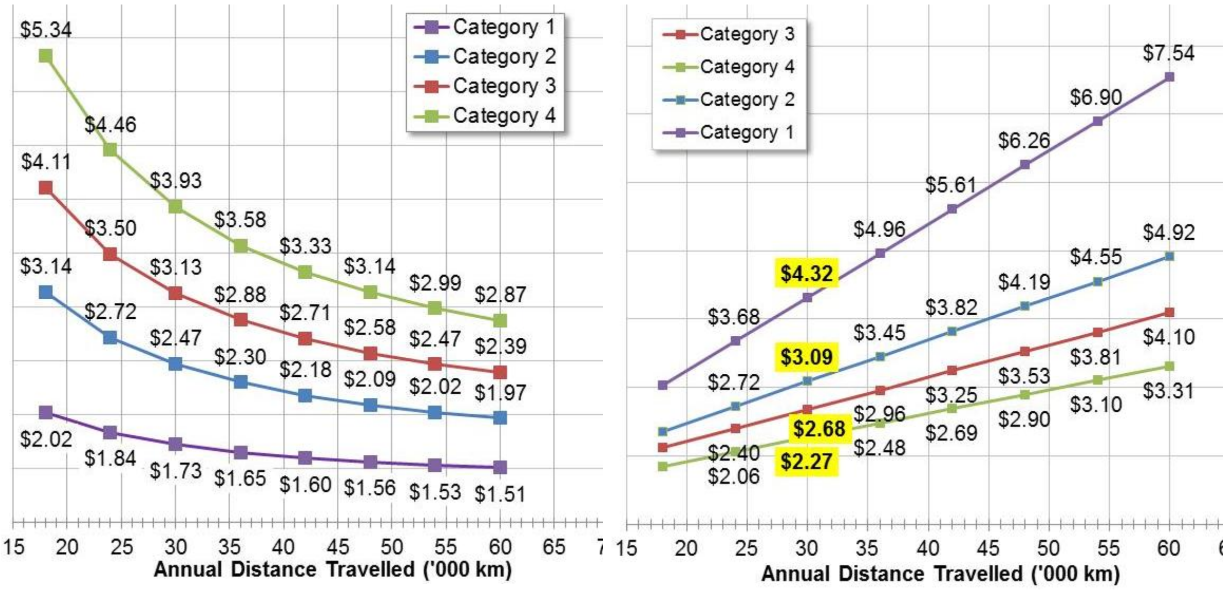


Figure 47 Adjustment to step changes for annual distance travelled

There are no marginal costs on a per passenger basis until a change in bus Category is required (or an additional bus is needed). This was indicated in Figure 41, which presents costs per seat (or per passenger for a fully utilised bus) by bus category. We note that the *recovery* of costs is affected by utilisation, not the true cost of providing the service – lower utilisation requires a higher cost per passenger to recover operating costs.

The recovery of cost per passenger therefore depends on both bus utilisation and the annual distance travelled, a complex relationship that is not easily presented in a graphical presentation.

7.3 Other Conclusions

We have drawn a number of other conclusions:

- Efficient Labour Costs

  This analysis has based driver costs on the rates in a typical current Enterprise Agreement. These rates are about 20% greater than those in the Award. Whilst it is recognised that remuneration in similar industries can vary, there appears to be no clear market basis for this differential.

  It is also noted that driver scheduling can have a significant impact on operating costs.

Increased competition in the award of contracts should be considered, as well as the use of a driver scheduling tool (e.g. HASTUS) to demonstrate efficient use of drivers and reduce driver costs, which are a significant cost component.

- Residual value of buses at the end of the mandated service life:

  This analysis has followed IPART's regulatory model and ignored residual value, implicitly enabling operators to retain any sale proceeds.

  The potential impact of this approach is difficult to assess. There are several agents for used buses, many of which offer the same stock for sale. One of the largest agents claims to have sold more than 2,000 buses to 450 customers in Australia, NZ and Fiji, but we have not seen details to support this claim and the period covered is not stated. Sales appear to be primarily of coaches and school buses, largely to schools for their own use.

  The NSW rural and regional fleet currently has 33 buses that will have to be sold in the current 12 month period to comply with the TfNSW maximum age requirement (25 years for Category 3 and 4 buses). Recent sales and current list prices for comparable models and vintages are between 3% and 14% of the original purchase price (escalated to FY17 dollars), averaging about 9%.

  In July 2017 we identified 6 buses of a comparable vintage listed for sale. It is not clear how quickly the buses sell, so it's difficult to estimate the market for used buses. If buses typically take 2 months to sell, for example, the implication would be that the market could absorb about 36 buses a year (supplied from all States, not just NSW).

  We suspect that this is not a vibrant market, and any pressure on prices is more likely to be down rather than up.

  A more thorough investigation into residual value may be warranted. We conclude in the interim that, for the purposes of this study, an indicative mean residual value could be assumed to be 9% of the original vehicle cost expressed in current dollars.

  If residual value were to be included in the derivation of unit costs, the return of capital component of the bus unit cost would therefore reduce by 9%. The return of capital component of unit cost per km varies from 3% for a Category 1 bus to 12% of the total for a Category 4 bus, so allowing for residual value would reduce total unit costs by 0.3%, 0.6%, 1.0% and 1.1% for Categories 1 through 4 respectively.

  It should be noted that the maximum age mandate applied by TfNSW has the effect of increasing capital costs where the actual service life of the vehicle is longer than that age. A maximum age rule presumably reflects an assumed lowest acceptable vehicle condition, which in turn is strongly influenced by total distance travelled by the bus.

  The same age-based restriction may not reflect the lowest acceptable condition of rural buses, which will travel considerably less distance in that time. The effect of the restriction is that capital costs are higher for these buses than they would otherwise be, making them more expensive to operate. We consider that this issue is worth a review by TfNSW.

- Service reliability:

  Reported data on service reliability is not comprehensive and has therefore not been used in this study.

  TfNSW provides an allowance of 10% in either buses or funding to ensure delivery of services to the standard required. We consider this a typical and prudent allowance, and do not propose an adjustment to this policy.

- Appropriateness of the fleet:

  We noted in Figure 42, which shows implied bus categories currently in use, that there appears to be opportunity to rationalise the bus fleet based on reported patronage. Figure 45 estimates the impact of possible changes in future demand on the fleet.

Patronage data indicates that a majority of B contracts have very low average bus utilisations, and in many cases a step down by two bus Categories could be required to provide an efficient service (with some allowance made for peak demand). These contracts operate a pool of vehicles across their routes, so it should be possible to retain larger buses for use during peak demand and use smaller buses outside peak, a policy that would reduce the total cost of the service.

- Opportunities for flexible transport solutions:

  Experience indicates that flexible transport options provide a different and perhaps higher level of service to a smaller client base, but generally at a higher cost than fixed, traditional bus services. The cost of the driver is clearly more significant for the smaller vehicles that are more likely to be used for flexible solutions, which suggests that flexibility in terms of route may not be a cost-effective solution.

  Flexibility in terms of trips on relatively stable routes will, however, provide a cost advantage and opportunities to develop this concept could be pursued.

  We note that 'B' contracts that operate regular and school routes have an opportunity to re-use school buses out of school hours for regular services. In practice, however, the morning commuting peak coincides with morning school trips, and regular patronage outside of this time appears to be so low that a smaller bus would be more efficient in delivering the off-peak regular service required. The implication is 'B' contracts could be more efficient if a wider range of vehicle Categories were available for the operator. We consider that this opportunity could be significant enough to warrant further investigation by TfNSW.

- Policy and contract structure:

  The cost analysis completed indicates that unit operating costs are primarily a function of route and bus Category. Whilst overhead costs increase with fleet size in absolute terms, this too appears to be related to the number of seats, with no apparent economies of scale. There does not therefore appear to be a cost basis for varying the contract by fleet size.

  Whilst the medium and large contracts include an obligation for the operators to identify opportunities for increased efficiency or effectiveness in delivering the service, there seems little incentive for them to do so, particularly if the change is likely to result in a reduction in revenue.

  It appears that flexibility in terms of the allocation of vehicle to route is not as effective as it could be, and there may be opportunities to develop policy options that provide more flexibility for vehicle allocation.

7.4 Recommendations

Based on this review, we make the following recommendations:

- This review did not identify a strong rationale for managing bus contracts by fleet size or for categorising buses by the number of seats, as is current practice. There is enough overlap between bus Categories 3 and 4 (defined by the number of seats) to make the distinction effectively immaterial, and although we have used the Categories as they stand, we recommend that categorisation based on bus configuration be adopted instead.
- We found that the previous 'A' and 'B' contract types were more useful for our purposes than the categorisation by size of fleet, since they represent different types of service provided. We recommend that a structure based on the nature of the service provided be considered for contract management.
- The current medium and large contracts include an obligation for operators to identify opportunities for increased efficiency or effectiveness in delivering the service, but there seems little incentive for them to do so. More flexibility in allocation of bus model to route would be beneficial**,** and we recommend that policy and contractual options be explored to improve efficiency in this area.
- The quality of data available on current service performance is relatively poor, and considerable effort was required during this review to establish accurate route characteristics and to identify buses actually used on routes in order to estimate seat capacity and therefore bus utilisation. No

route data was available for the school routes included in the ‘B’ contract routes (so it was not possible to include these in this review), and there are many inconsistencies in the route data that was provided.

We recommend that TfNSW clearly articulate the specific requirements for the reporting, with specific reference to definition of the cost items that are to be included within each of the current headings in Schedule 3 Annexure 1 of the operator contracts, to improve the consistency, quality and value of the data collected. This would provide TfNSW staff with higher quality data with which to manage its rural and regional bus service delivery program.

- This review has noted outliers among operators who appear to have significantly higher cost structures than their peers, and we recommend that TfNSW review these contracts to address the differences.
- TfNSW should consider reviewing its maximum age rule as applied to rural and regional buses, and review opportunities to reduce service costs among ‘B’ contracts by enabling or incentivising operators to have a wider range of vehicle sizes in their fleet.

Appendix A

Reference Documents and Data

Title	Dated	Author
Reports		
Regional and Rural contracts price benchmarks	17 March 2015	Deloitte
Regional and Rural Bus Services Contracts - Price Setting Methodology and Process Supporting attachments: Attachment B - Final A contract payments data Attachment C - A contract fleet details payments and termination values Attachment D - Final B contracts payments data Attachment D - Final B contracts payments data Fleet Data	October 2016	Deloitte
TfNSW Rural and Regional Bus Contracts Handover Documentation	31 October 2016	Deloitte
2017 Rural and regional bus fares review - Issues Paper	May 2017	IPART
Contracts		
bus-service-alteration-request-5371_1		
complete-confidentiality-agreement-bus-panel-ordering-acess		
draft-rrbsc-medium-271115		
draft-rrbsc-small-271115		
draft-rrbsc-very-small-271115		
tcrp_syn_53		
R&R Bus Services		
Large Operator Contracts Numbers: 0117 0328 0816 0822 0326 0793 0817	2016	TfNSW
Medium Operator Contracts Numbers: 0042 0299 0314 0800 0089 0301 0317 0805 0113 0302 0323 0812 0187 0305 0726 0813 0208 0306 0784 0814 0233 0309 0787 0819 0237 0311 0789 0821 0276 0312 0794 0823	2016	TfNSW
Small Operator Contracts 0033 0256 0308 0303	2016	TfNSW

Title				Dated	Author
0038 0054 0084 0091 0094 0095 0129 0132 0139 0146 0148 0155 0184 0193 0195 0218 0219 0226 0236	0267 0272 0292 0297 0304 0307 0310 0318 0319 0329 0650 0100 0119 0121 0213 0217 0275 0277 0296	0320 0505 0535 0608 0641 0668 0694 0695 0696 0701 0702 0711 0712 0713 0714 0718 0720 0734 0743	0753 0761 0767 0778 0785 0788 0790 0795 0796 0798 0802 0803 0804 0811 0815		
Very Small Operator Contracts				2016	TfNSW
A907 A919 0001 0002 0003 0004 0005 0006 0007 0008 0009 0010 0011 0012 0013 0014 0015 0016 0017 0018 0019 0020 0021 0022 0023 0024 0025 0026 0027 0028 0029 0030 0031 0032 0034 0035	0150 0151 0152 0153 0154 0156 0157 0158 0159 0160 0161 0162 0163 0164 0165 0166 0167 0168 0169 0170 0171 0172 0173 0174 0175 0176 0177 0178 0179 0180 0181 0182 0183 0185 0186 0188	0321 0322 0325 0327 0330 0500 0501 0502 0503 0504 0506 0507 0508 0509 0510 0511 0512 0513 0514 0515 0516 0517 0518 0519 0520 0521 0522 0523 0524 0525 0526 0527 0528 0529 0530 0531	0626 0627 0628 0629 0630 0631 0632 0633 0634 0635 0636 0637 0638 0639 0640 0651 0652 0653 0654 0655 0656 0657 0658 0659 0660 0661 0662 0663 0664 0665 0666 0667 0669 0670 0671 0672		

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0046	0199	0541	0680		
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0103 0257 0588 0755 0104 0258 0589 0756 0106 0259 0590 0757 0107 0260 0591 0758 0108 0261 0592 0759 0110 0262 0593 0760 0111 0263 0594 0764 0112 0264 0595 0765 0114 0265 0596 0766 0115 0266 0597 0768 0116 0268 0598 0769 0118 0269 0599 0771 0120 0270 0601 0772 0122 0271 0602 0773 0123 0273 0603 0774 0124 0274 0604 0775 0125 0278 0605 0776 0126 0279 0606 0777 0127 0280 0607 0779 0128 0281 0608 0780 0130 0282 0610 0781 0131 0283 0611 0782 0133 0284 0612 0786 0134 0285 0613 0791 0135 0286 0614 0792 0136 0287 0615 0797 0137 0289 0616 0799 0138 0290 0617 0801 0140 0291 0618 0806 0141 0293 0619 0807 0142 0294 0620 0808 0143 0295 0621 0809 0144 0298 0622 0810 0145 0300 0623 0820 0147 0313 0624 0824 0149 0315 0625		
Outer Sydney Metro Bus Services OSMBC 1 OSMBC 5 OSMBC 9 OSMBC 2 OSMBC 6 OSMBC 10 OSMBC 3 OSMBC 7 OSMBC 11 OSMBC 4 OSMBC 8 OSMBC 12	**2015**	
Data Files		
R&R Bus Services		
A Estimated Service Km and Boardings		
B Actual Boardings 2011		
B Actual Boardings 2012		
B Actual Boardings 2013		
B Actual Boardings 2014		
B Actual Boardings 2015		
B Actual Boardings 2016		
B School Patronage Estimate 2015		

Title	Dated	Author
B Service Km		
RRBSC Fleet Data		
Rural and Regional Category 3 buses bus panel		
Rural and Regional Category 3 Partly Funded buses Bus Panel		
Rural and Regional Category 4 buses bus panel		
Rural and Regional Category 4 buses bus panel		
Rural and Regional One Door Urban Bus Partly Funded buses Bus Panel		
Rural and Regional One Door Urban buses bus panel		
Rural and Regional Bus Route List		
Outer Sydney Metro Bus Services		
CM-C010 Service Hours and KMs FY2011 to FY2014		
CM-O020 Operator Self Reported MOR June 2015 - As at 17.07.15		
Bus Replacement Programme		
Sheet 13 - Bus Capex - Capital cost of NFPP buses		
Operational Reports		
R&R Bus Services Half-yearly: M0042 M0800M M0317 M0813 M0089 0301 M0323 M0814 M0113 M0302 M0505 M0818 M0187 M0305 M0726 M0819 M0208 M0306 M0784 M0821 M0233 M0309 M0787 M0823 M0237 M0311 M0789 M0276 M0312 M0794 M0299 M0314 M0812		
R&R Bus Services Quarterly (Q1 and Q2) L0117 L0328 L0816 L0822 L0326 L0793 L0817		
KPI Reports		
Small Operators 0033 0155 0535 0734 0038 0193 0608 0744 0054 0195 0641 0753 0084 0213 0650 0761 0091 0217 0668 0762 0094 0218 0694 0763 0095 0219 0695 0767 0100 0226 0696 0770 0109 0236 0701 0783		

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Very Small Operators					
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0127	0283	0612	0775		
0128	0284	0613	0776		
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0138	0293	0622	0808		
0140	0294	0623	0809		
0141	0295	0624	0810		
0142	0500	0625	0824		
0143	0501	0626			
0144	0502	0627			
0145	0503	0628			
0147	0504	0629			
		0630			
Outer Sydney Metro Annual Reports					
OSMBC 01	OSMBC 06	OSMBC 09			
OSMBC 02	OSMBC 07	OSMBC 10			
OSMBC 04	OSMBC 08	OSMBC 12			

Appendix B

Review of Bus Contracts

Appendix B Review of Bus Contracts

Bus operators are engaged under one of four standard contracts, based on the size of the operator's fleet as shown in Table B-1.

Table B-1 Bus Operator Contract Types

Operator Contract	Bus fleet size
Large	>40
Medium	16 to 40
Small	6 to 15
Very Small	<6

A broad comparison of the contract types has been completed. This is comparison is intended to highlight differences between contract types which may have cost implications and is not to be taken as an exhaustive review of the terms.

The key differences are presented in Table B-2 and illustrate the following progressive amendments with operator size:

Table B-2 Operator contract comparison from Very Small Operator Contract

Amendment by Contract type	Small Operator	Medium Operator	Large Operator
5.4 (l)	For a new bus as a result of a service variation, the requirement to provide back up data within 7 days relaxed.	For a new bus as a result of a service variation, the requirement to provide back up data within 7 days re-introduced.	No further change.
8			Operator responsible for the repair of bus stop signage and for the installation of new bus stop signage.
9	-	Operator is required to provide a Service Desk to respond to customer enquiries and complaints.	No further change.
13	Requires TfNSW approval in writing before substituting a bus, even for repairs.	No further change.	No further change.
13.4	-	-	Specific requirements for depot capacity to allow for 10% increase of seat numbers and for spare buses.
14.1	-	-	Operator required to provide bus replacement programme for the complete term at the start of the contract, with scope for review.

Amendment by Contract type	Small Operator	Medium Operator	Large Operator
15.6	-	-	Introduction of a clause to provide for the use of depot assets by a new operator should the term not be renewed.
17	-	-	Introduction of requirement to develop and implement and accessible transport action plan to comply with DDA regulations, an environmental plan to address requirements of ISO 14001 and a Passenger Relations Plan, all to be publically available.
19.1	-	More specific requirements regarding subcontractor documentation that must be provided to TfNSW	No further change.
22	-	More prescriptive requirements for supporting TfNSW in investigating any WHS incidents.	No further change.
23.1	-	-	More specific warranty requirements with reference the required plans and levels of service.;
Attachment B	-	-	Introduction of the requirement for a performance bond
Schedule 1: 4.6	-	More specific requirements including to publish and notify passengers of changes to timetables or routes	No further change.
Schedule 1: 4.15	-	Clarification included on presentation of timetable information	No further change.
Schedule 1: 5	-	Specific requirements to inform passengers and TfNSW regarding service delays.	No further change.
Schedule 1: 6.5	-	Operator responsible for obtaining approvals and installing new bus stop signage to the required standards.	No further change.
Schedule 7	-	Specific requirements for Service Desk, including provision of trained personnel, the need to monitor trends and implement processes to resolve issues identified.	No further change.

Amendment by Contract type	Small Operator	Medium Operator	Large Operator
Schedule 3: 1.1	Allows for bus payments terms to vary by bus category, i.e. 156months for Category 1 or 2, 180months for Category 3 or 4, as opposed to 120months for all buses in the Very Small Operator Contracts.	No further change.	No further change.
Schedule 3: 4.1	Allows for spare buses resulting from a service variation to be provided at a ratio of 1 spare for every 10 peak buses added to the fleet, as opposed to an increase in the overhead allowance for Very Small Operators. Also allows increased granularity in calculation of bus depreciation when stepping up a bus category or removing a bus as a result of a service variation.	No further change.	No further change.
Schedule 3: 4.2	-	Scope for monthly payment to operator to be reduced if KPIs not met.	No further change.
Schedule 3: 4.4	Provides for written off calculation for new buses and for Category 1 and 2 buses not acquired under the Seat Belts in Buses Program.	No further change.	No further change.
Schedule 4: 3.7	Detailed report on KPI defaults introduced, to be submitted within 15days of KPI reporting period.	Inclusion of reporting on credits for KPI defaults (See Schedule 3: 4.2 above).	No further change.
Schedule 4: 5	-	New section on the calculation of KPI credits.	
Schedule 4: 6	-	KPI credit weighting applied at 40% to each of 3 criteria: - punctuality, - cancelled or incomplete trips - major bus defects	KPI credit weighting extended to apply at 15% to each of 7 criteria – as for Medium Operator plus: - Data maintenance - CCTV reliability - Reporting - Customer complaints
Schedule 4: 8/9	-	KPI reporting frequency increased to every contract half year.	KPI reporting frequency increased to every contract quarter year.
Schedule 5: Item 6	-	Operational report frequency increased to every half year.	Operational report frequency increased to every quarter year.

Amendment by Contract type	Small Operator	Medium Operator	Large Operator
Schedule 5: Item 7	-	Half yearly commercial report required	Quarterly commercial report required
Schedule 8: 2.2	-	Introduces a constraint on the average age of the fleet (8 yrs for Cat 1&2, 12yrs for Cat 3&4) - in addition to the maximum age limits of 15yrs for Cat 1&2 and 25yrs for Cat 3&4.	No further change.
Schedule 8: Annexure 3	New annexure providing for listing of multiple depots.	No further change.	New annexure providing depot head lease terms.
Schedule 9	More prescriptive reporting format for personnel and payroll details introduced.	No further change.	No further change.

In all cases, the operator is required to provide bus services, for the duration of the contract:

1. on the Bus Routes;
2. in accordance with the Timetables and the relevant provisions of the Services Schedule; and
3. in a manner that effectively and efficiently carries out the Contract Service Levels with Contract Buses of the required Bus Category,

For dedicated School Services the operator must provide services:

1. to the schools set out in the Dedicated School Services Timetable;
2. in accordance with the Dedicated School Services Timetable and the relevant provisions of the Services Schedule; and
3. (iii) in a manner that effectively and efficiently carries out the Contract Service Levels with Contract Buses of the required Bus Category.