

Western Australian Auditor General's Report



Planning and Management of Bus Services



Report 23: November 2017

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WESTERN AUSTRALIAN AUDITOR GENERAL'S REPORT

Planning and Management of Bus Services

Report 23
November 2017



**THE PRESIDENT
LEGISLATIVE COUNCIL**

**THE SPEAKER
LEGISLATIVE ASSEMBLY**

PLANNING AND MANAGEMENT OF BUS SERVICES

This report has been prepared for submission to Parliament under the provisions of section 25 of the *Auditor General Act 2006*.

Performance audits are an integral part of the overall audit program. They seek to provide Parliament with assessments of the effectiveness and efficiency of public sector programs and activities, and identify opportunities for improved performance.

This audit assessed whether the planning and management of bus services within the Perth metropolitan area is efficient and effective.

I wish to acknowledge the staff at the Public Transport Authority and Department of Transport for their cooperation with this audit.

A handwritten signature in black ink, appearing to read 'C. Murphy'.

COLIN MURPHY
AUDITOR GENERAL
29 November 2017

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Auditor General's overview

Buses are an essential part of our public transport system, moving people to work and study, linking them to trains, and providing a community service to people and places with limited transport options. Over the last 10 years the bus network in Perth has expanded significantly, providing more frequent services on existing routes, and new services to the growing metropolitan area.



Expansion comes with increased costs, and has also coincided with a fall in the number of people using buses. Buses have become less efficient and, as fare revenue has dropped, the government subsidy has risen to over \$400 million. Subsidies are a feature of public transport systems around the world, but simultaneously rising costs and falling patronage are not sustainable.

Many factors that influence patronage are outside of single agency control, and require whole of government action. More joined up transport planning and clearer targets, including for buses, would help set direction and provide accountability. At the same time, PTA can take action on costs and patronage, but needs to develop a broader range of operational and strategic initiatives to deliver a more sustainable bus network for Perth.

Executive summary

Introduction

This audit assessed the efficiency and effectiveness of the planning and management of bus services within the Perth metropolitan area. We focused on the following questions:

1. Are bus services effectively planned?
2. Are bus services delivered effectively and efficiently?
3. Are initiatives in place to increase patronage?

This audit did not include a cost-benefit analysis of different bus service operating models.

Background

Buses form part of an integrated public transport system, and reduce demand on the road network, ease traffic congestion and provide a valuable community service. They provide high frequency services during peak transit periods that feed Perth's trains, and move people within and between activity centres. Buses are well suited to serve low residential densities and the increasingly dispersed employment, education, shopping and other trip-generating activities in Perth.

Public bus services in Perth have changed over the last 30 years. In the early 1990s the long-term cost trends for delivering public bus services were rising and service standards were declining. The operational part of bus services was put out to competitive tender, and all bus services were contracted out to private sector companies by 1998. At the time it was estimated the new operating model would save \$40 million per year.

Public Transport Authority (PTA) owns all Transperth buses, the majority of bus depots and the Transperth ticketing system. It controls and sets all routes and service standards. It also manages the bus replacement program and 11 bus service contracts operated through 3 specialist bus service contractors. The contractors are responsible for the daily operation and maintenance of buses.

PTA is responsible for all bus, train and ferry public transport services in the greater metropolitan area under the Transperth brand. The acceptable level of public transport services and associated fare structures are set by government policy. The Department of Transport is responsible for strategic transport policy, integrating transport planning solutions and coordinating investment decisions in collaboration with key stakeholders.

Bus services are more frequent in peak travel periods. Different timetables operate on weekdays, Saturdays, Sundays and public holidays. Where possible, PTA integrates bus and rail services. It also provides dedicated school bus services and buses for special events.

In 2017 PTA operated 1,469 buses along 68.2 million service kilometres. On a typical weekday it has over 15,000 standard service trips, including nearly 300 school service trips.

Demand for public transport can go up and down depending on population growth, the economy, availability of alternative travel options, cost of petrol, traffic congestion and availability and cost of parking. PTA has little or no control over these wider issues that influence demand.

Buses provide a non-commercial community based transport for people that often have no alternative transport options. Different types of services include high frequency buses, feeder services between suburbs and bus/train stations, and community and school services. PTA is required to plan an appropriate balance of these services to meet community and government expectations.

The development and expansion of Perth between 2000 and 2010 led to strong growth in public transport patronage. In 2011 the government invested in bus services to address overcrowding issues and accommodate expected future growth. PTA measures its effectiveness and efficiency in providing accessible, reliable and safe bus services using performance indicators that include:

- passengers per service kilometre
- accessible public transport
- service reliability
- level of overall customer satisfaction
- customer perception of safety.

Audit conclusion

PTA has been meeting its quality targets for accessible, reliable and safe bus services, but fewer passengers are getting on buses, reducing fare revenue at the same time as the cost of operating an expanded network is rising. As a result, bus services are less efficient and the cost to government is increasing, with the subsidy reaching \$410.5 million in 2016-17.

To prevent the subsidy from growing even further, PTA needs to reduce the cost of bus services and grow patronage. However, there are constraints on PTA's ability to do both of these things, and its plans to improve efficiency are, so far, limited. Increasing the frequency and reliability of services along mass transit corridors has improved patronage on some individual routes, however it has not improved efficiency across the whole network.

Retendering operating contracts has delivered price reductions. But PTA retains the cost risks associated with owning the bus fleet and its main options for cutting costs are to cut services on inefficient routes. PTA needs to identify the service changes that yield the greatest savings, while minimising the impact on patronage and the community. It has the information to do this, but needs to be more systematic in how it uses it.

Having better strategic transport planning and clearer goals would help PTA identify other initiatives to grow bus patronage and reduce costs. Reviewing the current model, which has been in place since the 1990s, would provide assurance to PTA that it has the arrangements in place to deliver a more sustainable bus network.

Key findings

Bus services are meeting quality targets, but services are less efficient, and the subsidy has increased to over \$400 million

Bus services have consistently met targets for accessibility, reliability, safety and customer satisfaction for the past 4 years. However, bus service costs have gone up as passenger numbers have fallen. Lower patronage has reduced fare revenue, so less of the operating cost has been offset, and the government has borne those costs through increases in the subsidy. Without growth in patronage, or reductions in costs, the cost to government will increase further.

It cost \$495.97 million to operate buses in 2016-17, compared to \$254.04 million in 2006-07, a 55% increase in real terms. This is mainly due to 355 buses and 18.3 million service kilometres being added to the network since 2006-07.

Despite increased capacity, higher frequency services and coverage of new residential areas, fewer people are using buses now than 4 years ago. As a result, revenue from fares dropped 7.7% between 2012-13 and 2016-17. Bus services are 28% less efficient than 10 years ago. It now costs \$1.18 per passenger kilometre compared with \$0.92 (in real terms) in 2006-07.

As costs have increased, and fare revenue has fallen, the total government subsidy has been rising, reaching over \$400 million in 2016-17. In 2016-17, revenue from bus user charges and fees, and other income, totalled \$85.44 million. This is only 17% of the \$495.97 million it cost to run bus services. PTA has estimated the total public bus subsidy will increase by \$38.1 million between 2016-17 and 2019-20. The cost to government will increase further without growth in patronage, higher bus fares or reductions in operating costs.

PTA retains cost and patronage risk so its scope to reduce costs and improve efficiency is limited

The operation of bus services is contracted out to 3 companies, who provide the employees, and maintain buses and depots. Seven contracts have been retendered since 2009 with 6 of these generating reduced contract prices. PTA retains ownership of the bus fleet and depots and does this to reduce barriers to entry for new operators, and to avoid capture by incumbent operators. No new operators have won any of the 7 contracts that have been retendered, although 3 contract areas have moved between existing contractors.

Owning the fleet means PTA retains the cost risks associated with matching the fleet to passenger demand, buses being under-utilised and capital costs of fleet replacement. To reduce operating costs, PTA must reduce the number of service kilometres operated which is the primary basis of payment to its bus service contractors. PTA has reallocated service kilometres from low to higher patronage routes. While this may mean the buses are more efficiently used, it does not reduce overall costs.

The main way to reduce overall costs is for PTA to target service revisions that reduce overall service kilometres through improved service delivery planning that identifies overservicing, duplication and under-utilisation. To realise the full extent of cost reductions, PTA will need to dispose of any excess buses to avoid paying the costs of ownership when buses are not used.

Bus contractors are provided small incentives to increase patronage but the cost associated with falling patronage is borne by PTA. Temporary patronage safety net arrangements have resulted in total payments to contractors of almost \$9 million between July 2014 and December 2016.

While the current arrangements allowed PTA to contract out operation of the bus services and expand the network, arrangements have not been reviewed since introduced. Given the changes in demand for services and efficiency, PTA should review whether the current arrangements provide the best balance of competition, risk transfer and the flexibility to improve efficiency.

PTA is planning to spend almost \$680 million over a 10-year period to replace and expand the bus fleet

PTA estimates that bus fleet replacement and expansion will cost nearly \$680 million from 2018-19 to 2027-28. Extending the life of the fleet, while it would affect maintenance costs, would be a way of reducing capital investment. However, PTA's options to defer replacement are constrained. This is because the operational lives of the 512 compressed natural gas buses that make up about one third of the fleet cannot be extended due to operational risks, and all have to be replaced by 2026.

New transport projects and forecast increases in demand drive the need to expand the bus fleet. PTA has, so far, identified the need for 26 extra buses to service the Forrestfield-Airport Link. It also forecasts the need for 28 extra buses each year to meet increases in demand, based on predicted population growth. Given current trends in patronage and inefficiency of the current network, PTA may consider reviewing these forecasts. PTA could also look at reviewing over serviced bus routes and reallocate existing fleet resources potentially reducing service kilometres and peak-bus requirements, rather than seeking additional buses.

PTA is not using its information effectively to identify where it can achieve the greatest efficiencies

PTA has good information about bus routes and how passengers use the network, but it is not using it effectively to identify which service changes will produce the greatest efficiencies. PTA has used its information to track annual trends in patronage, and then reallocate service kilometres from low patronage routes to ones with higher demand by reducing or removing the service. This approach to reducing costs is limited if overall service kilometre delivery is not reduced, and because the routes with low patronage often represent a very small proportion of total costs.

We looked at routes which account for higher proportions of total costs but where patronage does not justify the level of service. Changing service frequency on these routes could offer greater efficiencies, with potentially less social impact, than PTA's current approach.

Better strategic transport planning and clearer targets would help PTA identify the best ways to improve bus patronage

The *Perth and Peel Transport Plan for 3.5 Million People and Beyond* is intended to guide the development of Perth's transport network. However, there are no targets for the share of journeys that should be made by bus, or the increases in patronage that PTA should be aiming to achieve under the plan. The Department of Transport, PTA and Main Roads WA have started working on mode share targets for particular corridors and strategic centres and aim to complete this work by the end of 2018.

Bus priority lanes are one of PTA's key initiatives to improve patronage. In April 2017, PTA prioritised 24 additional projects to address current traffic congestion along mass transit corridors. But, PTA does not own the roads and there is no specific enabling legislation to establish bus priority measures. This often results in substantial delays.

PTA is also not able to demonstrate how much patronage changes in response to the frequency or reliability of services. This makes it difficult to demonstrate that the prioritised initiatives are those which will have the greatest effect. Although the Department of Transport and PTA are improving strategic transport planning, a broader range of initiatives are needed to increase patronage.

Recommendations

1. Given the unsustainable rising costs and declining patronage of bus services, PTA should by June 2018:
 - a. identify ways to reduce costs while balancing impacts on patronage, by using bus operations data more effectively to identify service changes that deliver greatest efficiencies
 - b. review how effectively the current arrangements transfer risk and provide flexibility to respond to changes in demand and manage costs
 - c. expand the focus of its initiatives to increase bus patronage beyond increasing services through mass transit corridors.
2. The Department of Transport and PTA should by June 2018:
 - a. set targets for the share of journeys that should be made by bus and patronage targets in order to measure achievements against the *Perth and Peel Transport Plan for 3.5 Million People and Beyond*
 - b. identify strategies that help facilitate bus priority measures (bus lanes and infrastructure) in a more timely manner.

Response from Public Transport Authority and Department of Transport

The Public Transport Authority (PTA) is immensely proud of the Transperth bus, train and ferry services it delivers to the community of Perth. The people, systems and processes used to deliver these important community services are quite unique, like the operating model used by PTA to deliver Transperth bus services.

For over twenty years, representatives responsible for the delivery of urban public bus services from around Australia and across the world have visited and contacted Transperth to obtain a better understanding of the Transperth operating model and in many instances have gone on to adopt this model of operation for their own public transport networks. For those in the industry, our contract arrangements follow 'world best practice' that maintain an appropriate balance of commercial risk between Government and its contracted service providers, but most importantly, places the needs of Transperth passengers to the fore and promotes an industry-wide culture of continuous improvement.

Transperth's comparatively low-density operating environment brings with it the very difficult challenge of balancing its obligations to provide a reasonable level of service to the more vulnerable people in our community, who often have no alternative transport options, and making the most efficient use of our available resources. As with any business arrangement, the Auditor General has found some areas of improvement, like the need to improve some of our service planning processes and documentation arrangements, which we will attend to as a priority.

As always, Transperth is looking at new and innovative ways of improving patronage. Passengers using our new Perth Busport with its state-of-the-art dynamic stand allocation system can now wait in air-conditioned comfort for their bus, and very soon we will deliver a real-time bus tracking system that will provide passengers with accurate real time predictions of bus arrival times via mobile apps and the website, taking away the uncertainty of travel times. Despite these initiatives and all-time high customer satisfaction levels, the recent unprecedented decline in the local economy has been particularly challenging for Transperth, as it has been for many other service related businesses in Perth but we are confident that as the economy improves, so too will our patronage levels.

Most importantly, PTA are most pleased to see that the Auditor General has confirmed that Transperth is meeting or exceeding targets for accessibility, reliability, safety and customer satisfaction, as these matters represent aspects of our business that we and our passengers believe are vitally important to making public transport more desirable.

Audit focus and scope

The audit assessed whether the planning and management of bus services within the Perth metropolitan area is efficient and effective, and focused on 3 lines of inquiry:

1. Are bus services effectively planned?
2. Are bus services delivered effectively and efficiently?
3. Are initiatives in place to increase patronage?

We focused on the management of Transperth bus services within PTA. We also assessed transport planning within the Department of Transport. The audit covered the period from 2006-07 to 2016-17.

In conducting the audit, we:

- reviewed plans, policies, processes and procedures for managing bus services
- interviewed staff at the Department of Transport, PTA and Main Roads WA
- held meetings with bus service contractors and discussed bus services with a number of local government staff within the metropolitan area
- reviewed key documents and analysed bus service data
- engaged a subject expert to assist the audit team.

We did not conduct a cost-benefit analysis of different bus service operating models to determine whether retaining ownership of buses and bus depots represented value for money and optimum risk management.

This was a broad scope performance audit, conducted under section 18 of the *Auditor General Act 2006* and in accordance with Australian Auditing and Assurance Standards. Performance audits focus primarily on the effective management and operation of agency programs and activities. The approximate cost of tabling this audit was \$475,400.

Audit findings

Bus services are less efficient and the subsidy is increasing, although passengers are satisfied and feel safe

In 2016-17, bus services met or exceeded PTA effectiveness targets for accessibility, reliability, safety and customer satisfaction. But, at the same time it is costing more to run the services, fewer passengers are getting on the buses, and the cost to government is rising. Costs will continue to rise if PTA do not take steps to address the current situation.

Bus services are largely meeting or exceeding PTA targets for reliability and safety, and overall customer satisfaction is high

Customers consider accessibility, reliability and safety as key factors that determine whether they use public transport. PTA's effectiveness performance indicators reflect these factors, and are similar to indicators used by other jurisdictions.

In 2016-17, PTA provided accessible public transport to almost 85% of the 998,993 property street addresses within the Perth Public Transport Area. Similar performance levels just below target were recorded in the previous 4 years. Accessibility is measured as the proportion of property addresses within the Perth Public Transport Area which are:

- within 500 metres of a bus stop with a 20 minute or better service in the peak-flow direction
- at least an hourly service for the rest of the day.

Approximately 152,000 (15%) of properties do not have this proximity to public transport or receive a service below the acceptable level. Key reasons for this are low population density and road infrastructure not accommodating bus services. While it may not be effective or efficient to provide bus services to every property, lack of access can affect vulnerable members of the community such as young people and senior citizens who rely on public transport.

In 2016-17 customer satisfaction was above target at almost 90%. This was the same result as in 2015-16, which was the highest in 22 years, and more than 7% above target.

Customer perception of safety was also above 2016-17 PTA targets (Figure 1). Nearly all customers surveyed felt safe onboard buses during the day, and 83% during the night. Although customer perception of safety was lower at bus stations and interchanges, especially at night, it was still above PTA targets.

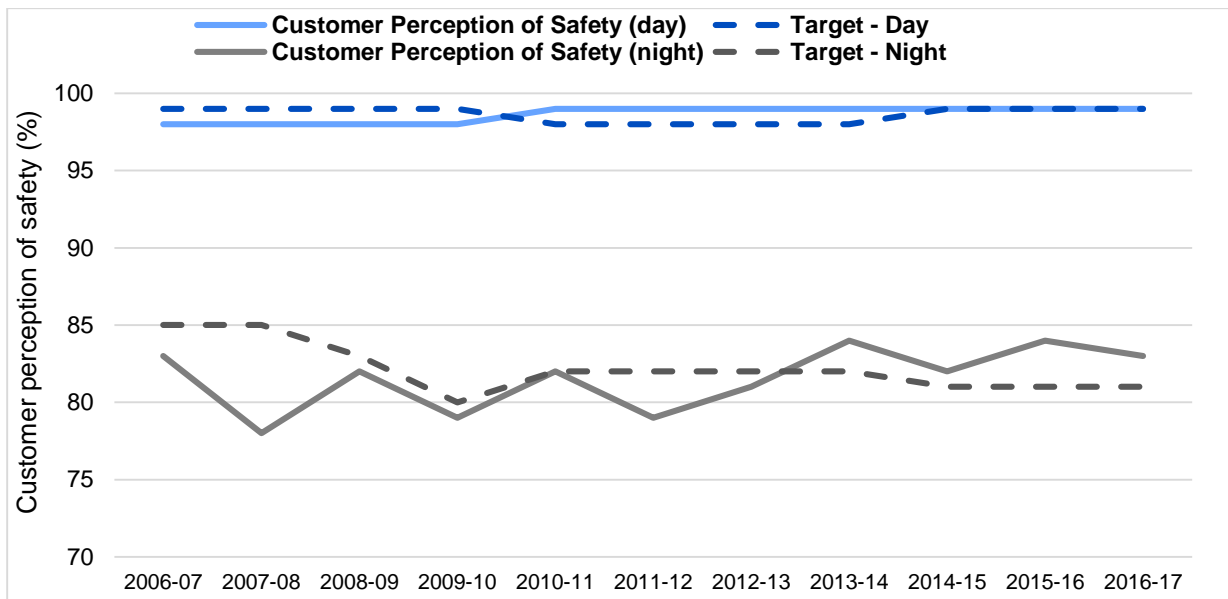


Figure 1: Customer perception of safety on buses during the day and at night

Another key customer measure of a quality bus service is service reliability. Bus services are considered to be on time if they arrive within 4 minutes of the scheduled time. In 2016-17, 84.26% of bus services ran on time, just short of the 85% target. However, this was higher than the 4 years prior (Figure 2).

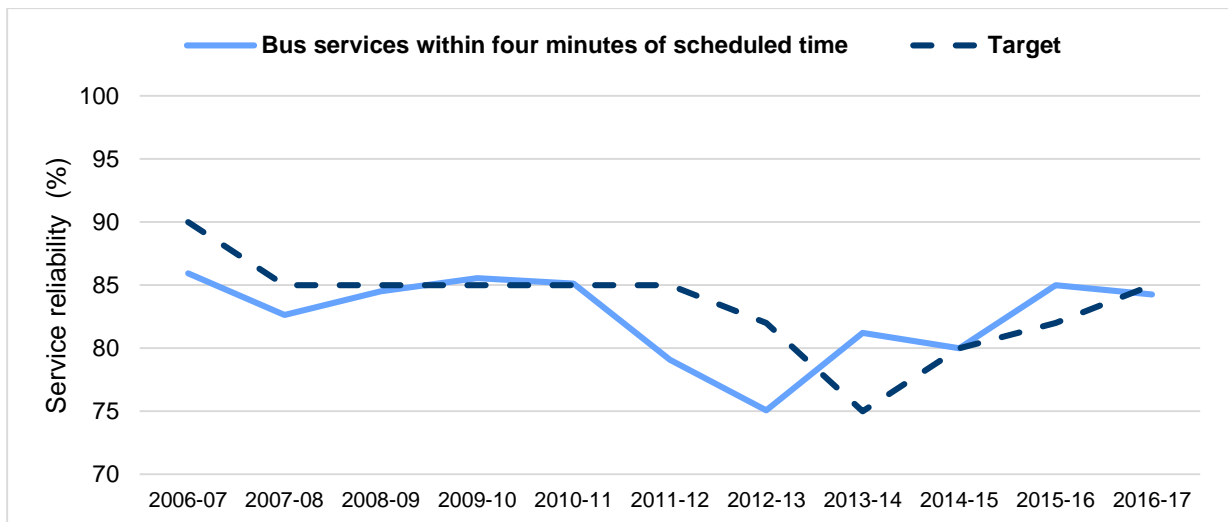


Figure 2: Bus services arriving within 4 minutes of the scheduled time

Operating costs are increasing, mostly because the bus network has expanded

Bus operating costs have gone up because there has been a significant increase in the number of buses and service kilometres. It cost about \$254.04 million to operate buses in 2006-07. This cost rose to \$495.97 million in 2016-17 (Figure 3). In real terms, adjusted for inflation, that is a 55% increase.

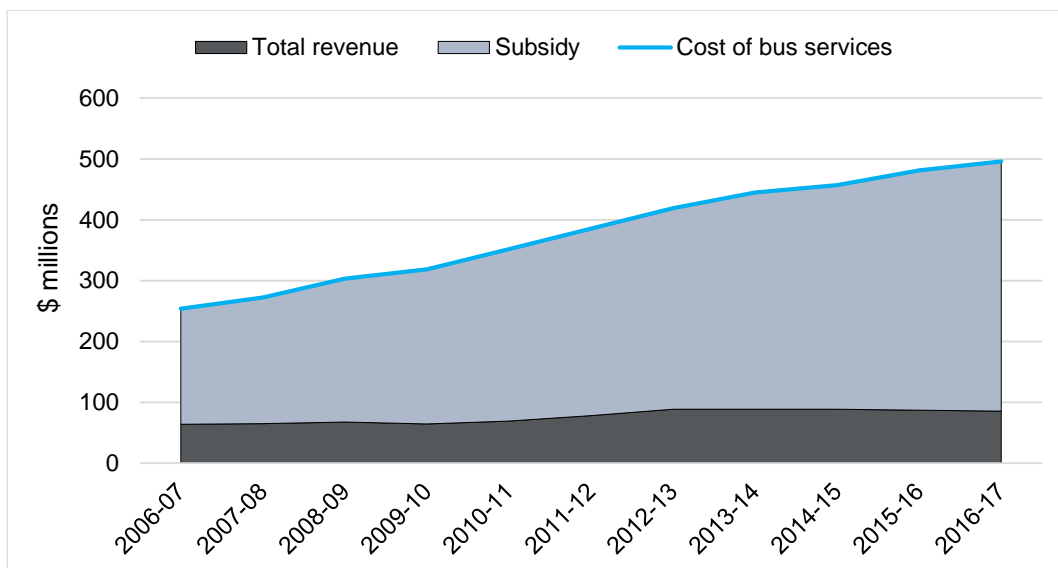


Figure 3: Operating costs of bus services

Since 2006-07 bus services have increased significantly. The bus fleet grew from 1,114 to 1,469 (32%). Over the same period bus service kilometres increased from 50 million to 68.2 million (36.5%). The extra buses and kilometres were used to increase capacity on existing routes, introduce new high profile services and expand services into developing urban areas.

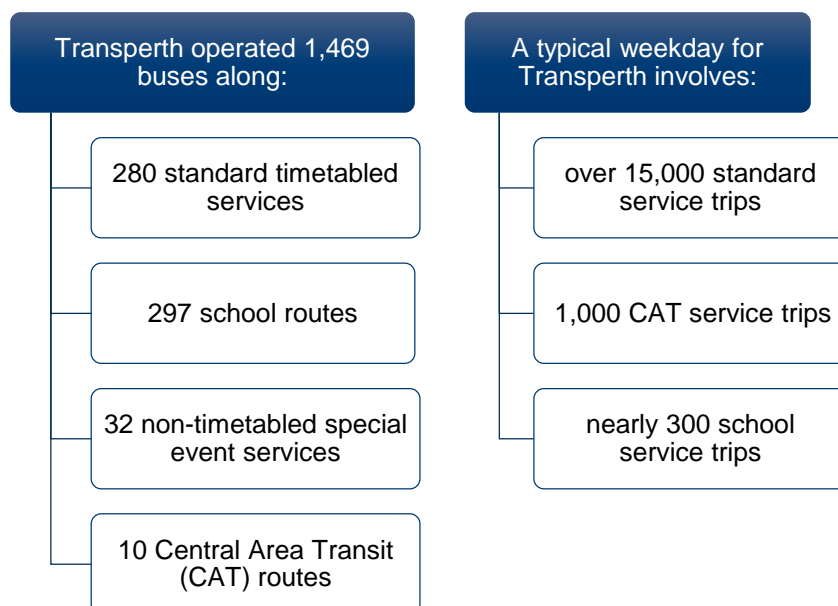


Figure 4: PTA operations in 2016-17

Patronage has fallen, reducing fare revenue, and bus services are almost 30% less efficient than they were 10 years ago

Despite investment in new and improved bus services, and higher frequency services, fewer people are using buses than 4 years ago (Figure 5). Although 15.4 million more passengers were carried in 2016-17 compared to 2006-07, total bus boardings were 80.017 million, 3.526 million less than 2012-13, and 4.35% below target. As a result, revenue from fares dropped 7.7% between 2012-13 and 2016-17.

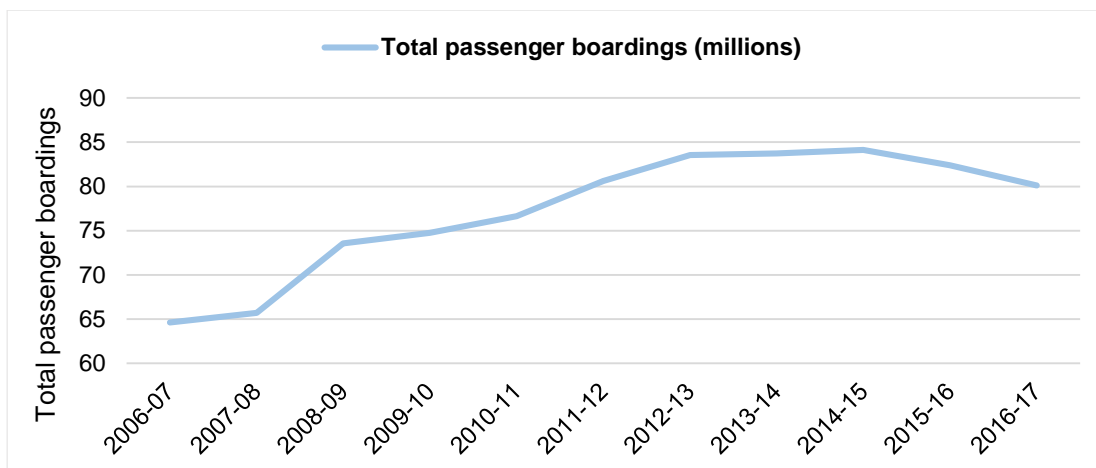


Figure 5: Total bus patronage

PTA believes a number of factors driving reduced patronage are beyond its direct control. Examples include a fall in population growth, the slowing economy, cheaper fuel and parking prices. PTA also considers that it can influence patronage through increased service frequency and providing better information to customers.

PTA’s effectiveness in providing a cost-efficient bus service is measured by the average cost per passenger kilometre. It cost \$1.18 per passenger kilometre in 2016-17 (Figure 6). It cost \$0.73 in 2006-07. In real terms, bus services are now 28% less efficient than 10 years ago.

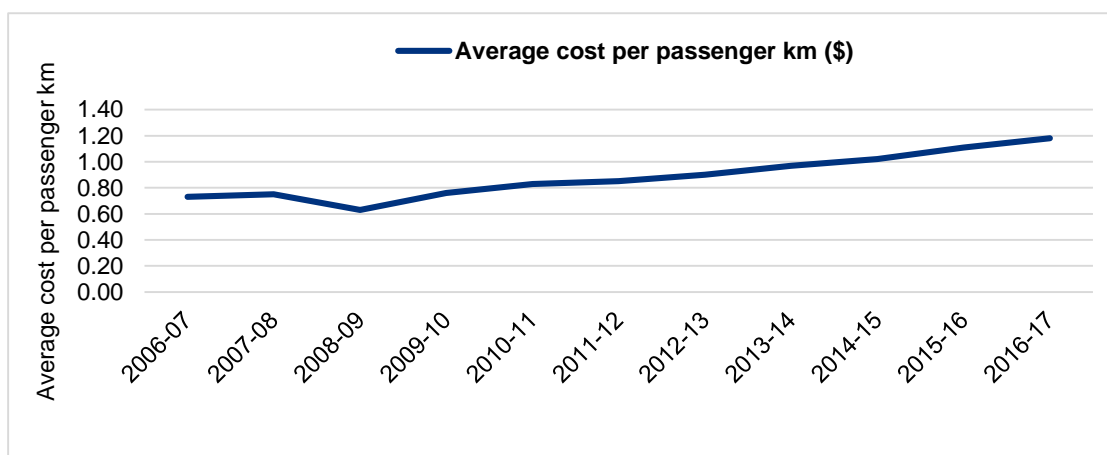


Figure 6: Average cost per passenger kilometre

The government subsidy for buses was \$410 million last year, and is forecast to rise

Similar to other states, public transport in WA is highly subsidised with government providing funding to cover the gap between operating costs and fare revenue. In 2016-17, that subsidy was \$410.5 million, after considering revenue from bus user charges and fees, and other income, of \$85.44 million (17% of total costs). PTA has estimated the total public bus subsidy will increase by \$38.1 million between 2016-17 and 2019-20. The cost to government will increase further without growth in patronage, higher bus fares or reductions in operating costs.

The cost of bus services in the Perth central business district (CBD) is partially offset by funds generated by the *Perth Parking Management Act 1999*. The Act charges a levy on CBD parking bays and some of the funds generated are directed to the free CBD transit area and CAT buses.

PTA manages contracts effectively, but retains cost and patronage risk which limits its scope to cut costs

PTA contracts out the operation of bus services to 3 companies, who provide the employees, and maintain buses and depots. PTA regularly retenders contracts and does not allow single contractors to operate more than 50% of service contracts. Seven contracts have been retendered since 2009 with 6 of these generating reduced contract prices. PTA monitors contractor performance against a range of measures and actively amends contracts to adjust services on particular routes.

PTA retains ownership of the bus fleet and depots and does this to reduce barriers to entry for new operators and to avoid capture by incumbent operators. Although 3 contract areas have moved between existing contractors, no new operators have won any of the 7 contracts that have been retendered.

Owning the fleet means PTA retains the cost risks associated with matching the fleet to passenger demand, buses being under-utilised and capital costs of fleet replacement. PTA has reallocated service kilometres from low to higher patronage routes. While this may mean the buses are more efficiently used, it does not reduce overall costs.

To reduce operating costs, PTA needs to reduce service kilometres which is the primary basis of payment to its bus service contractors. PTA will need to identify service changes that reduce overservicing, duplication and under-utilisation. To realise the full extent of cost reductions, PTA must then dispose of any excess buses to avoid paying the costs of ownership for unused buses.

PTA also retains patronage risk. The contracts include a patronage incentive arrangement which rewards contractors if patronage rises, but PTA introduced temporary patronage safety net arrangements in 2014, when falling patronage rates were making some contract areas unviable for bus contractors. Almost \$9 million was paid under these arrangements between July 2014 and December 2016.

While the current arrangements allowed PTA to contract out operation of the bus services and expand the network, arrangements have not been reviewed since introduced. Given the changes in demand for services and efficiency, PTA should review whether the current arrangements provide the best balance of competition, risk transfer and the flexibility to improve efficiency.

There are various options for bus operating models such as transferring ownership of assets to the private sector, using smaller buses on routes where population density and demand is low, and using on-demand services in very low patronage, off-peak hours. PTA could also look to other jurisdictions to see if there are lessons to be learned.

PTA is proposing to invest almost \$680 million in the bus network over a 10-year period

PTA estimates that almost \$680 million will be needed to replace buses that reach the end of their expected life, and to purchase 26 additional buses for the Forrestfield-Airport Link and 28 extra buses to meet service demand. This is based on PTA's procurement plan which assumes population growth of 13% over the next 10 years.

There are also potential public transport projects that may require additional buses. PTA estimates that additional buses would be needed to service new or extended rail lines at Ellenbrook, Joondalup, Thornlie and Armadale. Metronet would also have a significant impact on the number of buses needed.

Like many public transport providers, PTA owns a standard bus fleet. More than 90% of the fleet are standard buses which have a maximum capacity of 82 passengers. PTA also operates 100 articulated buses with a carrying capacity of 110 passengers.



Figure 7: Transperth standard buses (left) and articulated buses (right)

Extending the life of the fleet, while it would affect maintenance costs, would also reduce capital investment. The average age of the bus fleet is 8 years, but options to extend the life of the fleet beyond 2026 are restricted. This is because the operational life of the 512 compressed natural gas buses (that make up 35% of the fleet) cannot be extended beyond 16 years due to operational risks. This limits PTA's ability to try and defer capital costs by extending the operating life of the fleet. The expected life of a diesel bus is longer and could be extended subject to analysis of whole of bus life-cycle costs.

PTA is responsible for the size and capacity of the bus fleet and the quantity of services being delivered. The current contract for supply and delivery of buses is nearing completion at the end of 2018. PTA's 10-year bus replacement program which finishes in 2027-28 estimates up to 130 buses may be required per year.

Current patronage trends and current network inefficiency are important factors in forecasting long-term fleet requirements. Rather than purchasing additional buses, PTA could also look at reviewing bus routes that are comparatively over serviced (i.e. services in excess of requirement) and reallocate existing fleet resources, potentially reducing service kilometres and peak-bus requirements.

Information is not being used effectively to identify service efficiencies across the bus network

PTA has large and comprehensive databases of timetable, patronage and service delivery information. This data collection is provided through internal management systems, Smartrider and more recently the Real Time Tracking System. PTA uses data analysis tools to provide performance information at a bus route and network level. However, at a bus route level the way PTA uses the information is not systematically and effectively identifying which service changes will produce the most efficiencies.

PTA has used its information to track patronage trends, and then reallocate service kilometres from low patronage routes to routes which required additional capacity. While this can improve efficiency on one route and the quality of service on the other, it does not reduce overall costs or necessarily improve overall efficiency.

To reduce operating costs, PTA must reduce the number of service kilometres operated which is the primary basis of payment to its bus service contractors. When PTA has removed services entirely these have tended to be services with low patronage and service areas with low population density. While this approach may have minimised the number of people affected, it has not delivered significant savings because these infrequent routes represent a small proportion of total costs.

During our audit, we reviewed operational measures by routes across the bus network (Appendix 1). Looking at efficiency and cost data we found routes that:

- are inefficient based on low boardings per service kilometre, but offer limited scope for savings. This is because often the routes are at the edges of the network providing a relatively infrequent service to those communities at a small proportion of total costs
- are efficient because the routes are a relatively small proportion of total costs but have high patronage per service kilometre. For example, special school services and routes linking Butler and Joondalup, and the central-south of Fremantle
- are inefficient because the routes have relatively low passengers per service kilometre but account for a relatively high proportion of total costs. Examples include routes between Mandurah and Rockingham, and Rockingham and Fremantle.

PTA could achieve greater efficiencies by reducing the service frequency in mass transit routes where patronage does not justify the current level of service and costs (overservicing), particularly where bus routes duplicate other public transport services (see case example below). Frequency could be increased in the future if demand grows. PTA believes changing bus service frequency would affect patronage, but has not conducted the analysis to demonstrate what the impact would be.

Bus services running in parallel to train services

There are 6 bus routes that run along Kwinana Freeway between Canning Bridge and Elizabeth Quay, with no stops. These services effectively duplicate train services. There are opportunities for efficiencies to be achieved by reducing or cancelling these services, given that customers have an alternative service in place.

We estimate that stopping the service running from Canning Bridge to Elizabeth Quay would save nearly 1 million service kilometres and \$4 million a year. Removing over 100,000 bus trips a year would also reduce vehicle demand on one of the busiest sections of the Kwinana freeway. Reducing the frequency of these services or stopping them outside of peak hours would potentially provide some efficiencies.

PTA believes that changing the services to reduce the duplication would mean terminating services at Canning Bridge and that this would require significant investment in new bus facilities and road infrastructure. PTA also believes that the inconvenience of changing mode mid-journey could negatively impact patronage. PTA intends to operate using the same bus network until the improvements to the Canning Bridge interchange are commissioned.



The delivery of 298 school services affects peak fleet requirements and also the size of bus fleet that PTA owns. Over 50% of bus customers in peak travel periods are school children. This demand exists for short periods during the day, and for 8 months of the year, but is included in calculations for peak fleet requirements. This pushes up how many buses are in the fleet, and contributes to excess capacity outside of these peak hours and school terms. In assessing peak fleet, PTA may wish to consider reviewing options for providing school bus services to see if using other arrangements could reduce the size of the fleet, and reduce overall costs.

PTA's plans to improve patronage are limited; clearer targets and better strategic transport planning would help

It is not clear if PTA is on track to increase patronage

The *Perth and Peel Transport Plan for 3.5 Million People and Beyond* is intended to guide the development of a strategic, sustainable and robust transport network for Perth. One of its aims is to cater for 1.4 million public transport trips per day by the time the population reaches 3.5 million (estimated to be 2050). However, there are no targets for the share of journeys that should be made by bus, nor the increases to bus patronage that PTA should aim to achieve. The Department of Transport, PTA and Main Roads WA have started working on mode share targets for particular corridors and strategic centres and aim to complete this work by the end of 2018. Including targets for buses and other modes of public transport, would give clearer direction for PTA and provide better performance information to feed into future investment decisions.

In terms of bus services, the plan predicts that about 20 high frequency public transit corridors will have passenger volumes that will require bus priority measures. These measures typically shorten travel times, make services more reliable and reduce ongoing operating costs. PTA plans to establish bus priority measures along roads within mass transit corridors, but the majority of these are aspirational and unfunded.

Establishing bus priority measures also takes a very long time. For example, the Beaufort Street bus priority lanes took over 10 years to complete. One reason why it can take so long is because there is no specific enabling legislation to establish high frequency public transit corridors along key arterial roads. PTA does not own roads and bus priority measures have to be negotiated with local governments, Main Roads WA and other stakeholders. Each stakeholder can have competing road use priorities which can complicate negotiations.

In addition, a number of factors that affect patronage are beyond PTA's control, for instance costs around car use and parking, congestion, as well as wider economic factors affecting population growth, employment and the need to travel.

The Department of Transport and PTA are starting to improve strategic transport planning

Efficient and effective bus services in part depend on coordinated transport and land use planning. To improve integrated transport planning the Department of Transport has established a Transport Portfolio Governance Council, Integrated Transport Planning Sub-Committee, and a Transport Portfolio Planning Group.

In April 2017, PTA updated its bus priority investment plan to align with state transport plans and forecasts. It has prioritised 24 additional projects to address current traffic congestion that impacts on the reliability of existing bus services. In May 2017, a Bus Priority Planning Workshop agreed to review by July 2017 the need for specific enabling legislation to enable better public transport outcomes in a timely manner.

These are steps in the right direction. It is important that future mass transit corridors and public transport infrastructure are identified and bus priority measures are implemented. This will help ensure PTA has the right number of buses and service kilometres in the right place to deliver effective and efficient bus services throughout metropolitan Perth.

Appendix 1: Bus route data¹

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
15	Glendalough Station to Perth Busport	Full time daily	250,000 - 500,000	1.10	5.83	0.51%
16	Dianella to Perth Busport	Community link	20,000 - 50,000	0.98	6.30	0.05%
19	Yokine to Perth Busport	Full time daily	250,000 - 500,000	1.05	5.90	0.43%
20	Morley Bus Station to ECU Mt Lawley Campus	Full time daily	20,000 - 50,000	0.49	12.71	0.11%
23	Claremont Station to Elizabeth Quay Bus Station	Community link	20,000 - 50,000	1.28	5.11	0.06%
24	Claremont Station to East Perth (Point Fraser)	Full time daily	250,000 - 500,000	0.98	6.70	0.64%
25	Claremont Station to East Perth (WACA Ground)	Secondary feeder	100,000 - 250,000	0.80	8.21	0.27%
27	Claremont Station to East Perth (WACA Ground)	Full time daily	250,000 - 500,000	0.98	6.69	0.53%
28	Claremont Station to Perth Busport	Full time daily	100,000 - 250,000	0.79	8.32	0.42%
30	Curtin University Bus Stn to Perth Busport	Full time daily	250,000 - 500,000	0.81	7.34	0.61%
31	Salter Point to Perth Busport	Full time daily	100,000 - 250,000	1.04	5.73	0.35%
32	Como to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	0.98	6.04	0.33%
33	Karawara to Elizabeth Quay Bus Stn	Full time daily	50,000 - 100,000	0.73	8.16	0.22%
34	Cannington Stn to Perth Busport	Full time daily	750,000 - 1,000,000	1.25	4.74	1.05%
35	South Perth (Old Mill) to Elizabeth Quay Bus Stn	Full time daily	50,000 - 100,000	0.88	6.76	0.11%
36	Midland Stn to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	0.69	8.58	0.56%
38	Cloverdale to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	1.02	5.84	0.16%
39	Redcliffe to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	0.80	7.42	0.71%

¹ Includes only standard bus route data from April 2016 to March 2017. Costs include bus ownership and insurance costs.

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
40	Perth Airport T3/T4 to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	0.73	8.16	0.54%
41	Bayswater to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	1.08	5.76	0.25%
42	Maylands to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	1.48	4.18	0.23%
48	Morley Bus Stn to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.12	5.55	0.42%
55	Bassendean Town Centre to Elizabeth Quay Bus Stn	Full time daily	100,000 - 250,000	0.93	6.70	0.40%
60	Morley Bus Stn to Elizabeth Quay Bus Stn	Full time daily	750,000 - 1,000,000	1.86	3.33	0.73%
66	Morley Bus Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	3.64	1.70	0.05%
67	Mirrabooka Bus Stn to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.33	4.65	0.51%
68	Mirrabooka Bus Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	1.20	5.15	0.23%
70	Curtin University Bus Stn to Elizabeth Quay Bus Stn	Community link	20,000 - 50,000	0.68	8.79	0.11%
72	Cannington Station to Elizabeth Quay Bus Stn	Full time daily	500,000 - 750,000	1.42	4.18	0.75%
75	Canning Vale to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.04	5.70	0.51%
81	City Beach to Perth Busport	Secondary feeder	100,000 - 250,000	1.08	5.95	0.21%
82	City Beach to Perth Busport	Full time daily	100,000 - 250,000	0.92	6.96	0.39%
83	Wembley Downs to Perth Busport	Secondary feeder	100,000 - 250,000	1.22	5.25	0.25%
84	Wembley Downs to Perth Busport	Full time daily	100,000 - 250,000	1.16	5.52	0.35%
85	Glendalough Stn to Perth Busport	Full time daily	250,000 - 500,000	1.44	4.45	0.33%
97	University of WA South to Leederville Stn	Secondary feeder	250,000 - 500,000	1.53	4.29	0.35%
100	Cannington Stn to Canning Bridge Stn	Full time daily	1,000,000 - 2,000,000	2.10	2.88	0.80%
101	Curtin University Bus Stn to Canning Bridge Stn	Primary feeder	100,000 - 250,000	1.98	3.04	0.18%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
102	Cottesloe Stn to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.10	5.98	0.72%
103	Fremantle Stn to East Perth (WACA Ground)	Full time daily	250,000 - 500,000	0.83	7.89	0.95%
107	Fremantle Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	1.03	6.36	0.40%
111	Fremantle Stn to East Perth (WACA Ground)	Secondary feeder	250,000 - 500,000	1.00	5.45	0.57%
114	Munster to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	0.62	8.70	0.64%
115	Hamilton Hill to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	0.62	8.74	0.96%
148	Fremantle Stn to Como	Secondary feeder	20,000 - 50,000	0.66	8.19	0.09%
150	Booragoon Stn to East Perth (Terrace Rd)	Secondary feeder	50,000 - 100,000	0.70	7.78	0.13%
158	Fremantle Stn to East Perth (WACA Ground)	Secondary feeder	100,000 - 250,000	0.67	8.11	0.44%
160	Fremantle Stn to East Perth (Terrace Rd)	Full time daily	250,000 - 500,000	0.64	8.53	0.81%
170	Bull Creek Stn to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.11	5.43	0.50%
176	Wilson to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	1.47	4.11	0.15%
177	Bentley to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	1.43	4.21	0.31%
179	Bull Creek Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	1.32	4.58	0.20%
201	Cannington Stn to Curtin University Bus Stn	Community link	0 - 20,000	0.31	19.33	0.02%
202	Westfield Carousel to Westfield Carousel	Secondary feeder	50,000 - 100,000	0.68	8.76	0.16%
203	Westfield Carousel to Westfield Carousel	Secondary feeder	50,000 - 100,000	0.90	6.58	0.15%
204	Murdoch University to Maddington Stn	Secondary feeder	250,000 - 500,000	1.11	5.57	0.43%
205	Murdoch University to Maddington Stn	Primary feeder	250,000 - 500,000	0.91	6.81	0.66%
206	Murdoch University to Cannington Stn	Primary feeder	750,000 - 1,000,000	1.18	5.10	1.32%
207	Murdoch University to Thornlie Stn	Secondary feeder	250,000 - 500,000	1.00	6.04	0.50%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
208	Murdoch Station to Cannington Stn	Secondary feeder	100,000 - 250,000	0.62	9.74	0.37%
210	Thornlie Stn to Gosnells Stn	Secondary feeder	50,000 - 100,000	1.10	5.64	0.10%
211	Thornlie Stn to Gosnells Stn	Secondary feeder	50,000 - 100,000	1.14	5.45	0.10%
212	Thornlie Stn to Southern River	Primary feeder	100,000 - 250,000	1.10	5.63	0.34%
220	Armadale Stn to Perth Busport	Full time daily	250,000 - 500,000	0.83	7.41	0.66%
223	Thornlie Stn to Thornlie	Peak Community Link	0 - 20,000	1.20	5.03	0.02%
228	Gosnells Stn to Thornlie Stn	Secondary feeder	100,000 - 250,000	1.14	5.44	0.21%
229	Westfield Carousel Shop Ctr to Maddington Central	Secondary feeder	100,000 - 250,000	0.81	7.68	0.35%
231	Gosnells Stn to Gosnells Stn	Secondary feeder	50,000 - 100,000	0.99	6.26	0.16%
232	Gosnells Stn to Gosnells Stn	Secondary feeder	100,000 - 250,000	1.12	5.50	0.16%
240	Kelmscott Stn to Kelmscott Stn	Community link	0 - 20,000	0.78	7.94	0.04%
241	Kelmscott Stn to Kelmscott Stn	Secondary feeder	50,000 - 100,000	0.62	9.95	0.22%
243	Kelmscott Stn to Armadale Stn	Secondary feeder	50,000 - 100,000	0.78	7.88	0.20%
244	Kelmscott Stn to Armadale Stn	Secondary feeder	50,000 - 100,000	0.62	9.99	0.22%
245	Kelmscott Stn to Armadale Stn	Primary feeder	100,000 - 250,000	0.85	7.32	0.38%
249	Armadale Stn to Kelmscott Stn	Secondary feeder	0 - 20,000	0.49	12.56	0.04%
250	Armadale Stn to Armadale Stn	Secondary feeder	100,000 - 250,000	1.13	5.47	0.15%
251	Byford to Armadale Stn	Secondary feeder	0 - 20,000	0.37	16.87	0.04%
252	Mundijong to Armadale Stn	Rural	20,000 - 50,000	0.61	10.18	0.13%
253	Jarrahdale to Armadale Stn	Rural	0 - 20,000	0.39	15.85	0.06%
254	Byford to Armadale Stn	Secondary feeder	100,000 - 250,000	0.65	9.50	0.32%
279	Maddington Central to Kalamunda Bus Stn	Community link	20,000 - 50,000	1.53	3.89	0.03%
282	Kalamunda Bus Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	0.55	10.79	0.38%
283	Kalamunda Bus Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	0.63	9.47	0.46%
284	Belmont Forum to Curtin University Bus Stn	Community link	50,000 - 100,000	0.65	9.18	0.15%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
285	Belmont Forum to Oats St Stn	Secondary feeder	0 - 20,000	1.00	5.95	0.02%
286	Maida Vale to Elizabeth Quay Bus Stn	Secondary feeder	20,000 - 50,000	0.61	9.71	0.07%
287	Forrestfield to Elizabeth Quay Bus Stn	Secondary feeder	20,000 - 50,000	0.66	9.06	0.09%
288	Forrestfield to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	0.59	10.16	0.60%
291	Gooseberry Hill to Kalamunda Bus Stn	Secondary feeder	0 - 20,000	1.18	5.01	0.01%
293	Kewdale to Elizabeth Quay Bus Stn	Secondary feeder	0 - 20,000	0.58	10.21	0.02%
294	Westfield Carousel to Midland Stn	Secondary feeder	100,000 - 250,000	0.55	10.76	0.66%
295	Walliston to Elizabeth Quay Bus Stn	Secondary feeder	50,000 - 100,000	0.68	8.71	0.12%
296	Kalamunda Bus Stn to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	0.63	9.46	0.43%
297	Kalamunda Bus Stn to Midland Stn	Secondary feeder	100,000 - 250,000	1.05	5.16	0.18%
298	Maida Vale to Elizabeth Quay Bus Stn	Secondary feeder	20,000 - 50,000	0.64	9.28	0.07%
299	Walliston to Elizabeth Quay Bus Stn	Secondary feeder	100,000 - 250,000	0.62	9.54	0.46%
301	Midland Hospital to Midland Stn	Secondary feeder	20,000 - 50,000	1.02	5.33	0.04%
304	South Guildford to Midland Stn	Secondary feeder	0 - 20,000	0.47	11.55	0.05%
307	Helena Valley to Midland Stn	Community link	0 - 20,000	0.82	6.65	0.03%
308	Middle Swan to Midland Stn	Community link	0 - 20,000	0.49	11.00	0.01%
310	Upper Swan to Midland Stn	Rural	20,000 - 50,000	0.54	10.12	0.10%
311	Bullsbrook to Midland Stn	Rural	50,000 - 100,000	0.49	11.04	0.15%
312	Baskerville to Midland Stn	Rural	0 - 20,000	0.25	21.46	0.07%
314	Midland Stn to Jane Brook	Secondary feeder	100,000 - 250,000	1.23	4.44	0.14%
315	Midland Stn to Stratton	Secondary feeder	50,000 - 100,000	1.06	5.14	0.13%
320	Midland Stn to Mundaring	Secondary feeder	100,000 - 250,000	0.49	11.17	0.35%
321	Glen Forrest to Midland Stn	Rural	20,000 - 50,000	0.64	8.47	0.05%
322	Glen Forrest to Midland Stn	Rural	100,000 - 250,000	0.61	8.91	0.26%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
323	Midland Stn to Swan View	Secondary feeder	50,000 - 100,000	0.84	6.52	0.14%
324	Midland Stn to Jane Brook	Secondary feeder	100,000 - 250,000	1.30	4.20	0.14%
325	Midland Stn to Stratton	Secondary feeder	50,000 - 100,000	1.02	5.34	0.12%
326	Midland Stn to Midvale	Secondary feeder	0 - 20,000	0.95	5.75	0.01%
327	Midland Stn to Swan View	Community link	20,000 - 50,000	1.36	4.00	0.03%
328	Wundowie to Midland Stn	Rural	20,000 - 50,000	0.36	15.05	0.15%
330	Mt Helena to Mundaring Town Centre	Rural	0 - 20,000	0.18	30.71	0.01%
331	Wundowie to Mundaring Town Centre	Rural	0 - 20,000	0.28	19.38	0.07%
334	Ellenbrook (Malvern Springs) to Ellenbrook Town Ctr	Secondary feeder	50,000 - 100,000	0.87	6.24	0.09%
335	Ellenbrook Town Ctr to Midland Stn	Rural	20,000 - 50,000	1.11	4.91	0.03%
336	Ellenbrook (Charlottes Vineyard) to Ellenbrook Transfer Stn	Secondary feeder	20,000 - 50,000	0.42	13.02	0.15%
337	Ellenbrook Town Centre to Ellenbrook Transfer Stn	Secondary feeder	50,000 - 100,000	0.75	7.24	0.16%
340	Caversham to Bassendean Stn	Secondary feeder	20,000 - 50,000	0.78	7.97	0.10%
341	Beechboro to Morley Bus Stn	Primary feeder	100,000 - 250,000	0.81	7.64	0.41%
342	Beechboro to Morley Bus Stn	Secondary feeder	100,000 - 250,000	0.99	6.27	0.23%
343	Beechboro to Morley Bus Stn	Secondary feeder	50,000 - 100,000	0.73	8.50	0.17%
344	Warwick Stn to Morley Bus Stn	Primary feeder	500,000 - 750,000	0.91	6.81	1.18%
345	Bennett Springs to Morley Bus Stn	Primary feeder	250,000 - 500,000	1.12	5.55	0.50%
346	Noranda to Morley Bus Stn	Secondary feeder	20,000 - 50,000	0.62	10.03	0.13%
347	Noranda to Morley Bus Stn	Secondary feeder	50,000 - 100,000	0.96	6.47	0.13%
349	Midland Stn to Morley Bus Stn	Community link	20,000 - 50,000	1.18	5.24	0.04%
352	Landsdale to Whitfords Stn	Secondary feeder	100,000 - 250,000	0.93	6.15	0.19%
360	Alexander Heights to Perth Busport	Secondary feeder	50,000 - 100,000	0.92	6.75	0.16%
361	Alexander Heights to Perth Busport	Full time daily	100,000 - 250,000	0.76	8.17	0.28%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
362	Ballajura to Perth Busport	Full time daily	100,000 - 250,000	0.84	7.34	0.29%
365	Kingsway City Shopping Ctr to Mirrabooka Bus Stn	Primary feeder	100,000 - 250,000	0.79	7.20	0.34%
370	Mirrabooka Bus Stn to Perth Busport	Secondary feeder	50,000 - 100,000	1.08	5.27	0.10%
371	Morley Bus Stn to Warwick Stn	Primary feeder	750,000 - 1,000,000	1.28	4.84	0.98%
372	Mirrabooka Bus Stn to Darch	Primary feeder	100,000 - 250,000	0.76	7.51	0.46%
376	Mirrabooka Bus Stn to Landsdale	Primary feeder	100,000 - 250,000	0.93	6.69	0.36%
377	Mirrabooka Bus Stn to Alexander Heights	Primary feeder	100,000 - 250,000	0.98	6.34	0.32%
378	Mirrabooka Bus Stn to Alexander Heights	Secondary feeder	50,000 - 100,000	0.50	12.32	0.25%
379	Mirrabooka Bus Stn to Ballajura Shopping Ctr	Community link	0 - 20,000	1.53	4.05	0.00%
380	Perth Airport T1/T2 to Elizabeth Quay Bus Stn	Full time daily	250,000 - 500,000	0.64	9.31	0.73%
384	Mirrabooka Bus Stn to Perth Busport	Full time daily	100,000 - 250,000	1.13	5.06	0.18%
385	Kingsway City Shopping Ctr to Perth Busport	Secondary feeder	20,000 - 50,000	0.81	7.09	0.09%
386	Kingsway City Shopping Ctr to Perth Busport	Full time daily	250,000 - 500,000	0.77	7.45	0.59%
387	Warwick Stn to Perth Busport	Secondary feeder	50,000 - 100,000	0.73	8.84	0.22%
388	Warwick Stn to Perth Busport	Full time daily	250,000 - 500,000	1.10	5.82	0.51%
389	Wanneroo to Perth Busport	Full time daily	250,000 - 500,000	0.70	8.15	0.70%
390	Banksia Grove to Joondalup Stn	Primary feeder	100,000 - 250,000	0.81	7.04	0.45%
391	Banksia Grove to Joondalup Stn	Primary feeder	250,000 - 500,000	0.87	6.55	0.46%
402	Stirling Stn to Perth Busport	Secondary feeder	100,000 - 250,000	1.04	6.15	0.39%
403	Stirling Stn to Perth Busport	Full time daily	250,000 - 500,000	0.98	6.56	0.58%
404	Osborne Park to Perth Busport	Community link	20,000 - 50,000	0.89	7.25	0.08%
406	Glendalough Stn to ECU Mt Lawley Campus	Secondary feeder	50,000 - 100,000	0.89	6.94	0.14%
407	Glendalough Stn to Glendalough Stn	Secondary feeder	50,000 - 100,000	1.27	5.04	0.12%
410	Scarborough Beach to Stirling Stn	Secondary feeder	50,000 - 100,000	0.91	7.04	0.17%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
412	Scarborough Beach to Stirling Stn	Secondary feeder	50,000 - 100,000	1.08	5.97	0.15%
413	Glendalough Stn to Stirling Stn	Community link	0 - 20,000	1.09	5.88	0.02%
414	Glendalough Stn to Stirling Stn	Secondary feeder	100,000 - 250,000	1.07	5.98	0.36%
415	Mirrabooka Bus Stn to Stirling Stn	Primary feeder	250,000 - 500,000	1.16	5.53	0.49%
421	Scarborough Beach to Stirling Stn	Primary feeder	100,000 - 250,000	1.59	4.05	0.26%
422	Scarborough Beach to Stirling Stn	Secondary feeder	50,000 - 100,000	0.70	9.14	0.15%
423	Warwick Stn to Stirling Stn	Primary feeder	250,000 - 500,000	0.74	8.69	1.00%
424	Karrinyup Bus Stn to Stirling Stn	Secondary feeder	50,000 - 100,000	0.63	10.21	0.23%
425	Warwick Stn to Stirling Stn	Secondary feeder	100,000 - 250,000	0.79	8.14	0.53%
427	Warwick Stn to Stirling Stn	Secondary feeder	50,000 - 100,000	0.69	9.31	0.16%
428	Warwick Stn to Stirling Stn	Secondary feeder	50,000 - 100,000	0.48	13.40	0.21%
441	Whitfords Stn to Warwick Stn	Primary feeder	100,000 - 250,000	0.62	10.35	0.66%
442	Whitfords Stn to Warwick Stn	Secondary feeder	100,000 - 250,000	0.54	11.89	0.59%
443	Whitfords Stn to Warwick Stn	Secondary feeder	100,000 - 250,000	0.53	12.12	0.47%
444	Whitfords Stn to Warwick Stn	Secondary feeder	100,000 - 250,000	0.55	11.73	0.38%
445	Whitfords Stn to Warwick Stn	Secondary feeder	100,000 - 250,000	1.10	5.82	0.29%
446	Whitfords Stn to Warwick Stn	Primary feeder	100,000 - 250,000	0.48	13.51	0.39%
447	Whitfords Stn to Warwick Stn	Secondary feeder	100,000 - 250,000	0.55	11.58	0.32%
450	Landsdale to Warwick Stn	Primary feeder	100,000 - 250,000	0.97	5.87	0.38%
460	Joondalup Stn to Whitfords Stn	Secondary feeder	100,000 - 250,000	0.76	7.54	0.43%
461	Joondalup Stn to Whitfords Stn	Primary feeder	250,000 - 500,000	0.66	8.59	0.62%
462	Joondalup Stn to Whitfords Stn	Secondary feeder	100,000 - 250,000	0.49	11.71	0.35%
463	Joondalup Stn to Whitfords Stn	Secondary feeder	100,000 - 250,000	0.65	8.75	0.32%
464	Joondalup Stn to Whitfords Stn	Primary feeder	100,000 - 250,000	0.49	11.66	0.39%
465	Joondalup Stn to Whitfords Stn	Primary feeder	100,000 - 250,000	0.66	8.65	0.28%
466	Joondalup Stn to Whitfords Stn	Secondary feeder	100,000 - 250,000	0.65	8.74	0.24%
467	Joondalup Stn to Whitfords Stn	Primary feeder	250,000 - 500,000	0.86	6.68	0.80%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
468	Joondalup Stn to Whitfords Stn	Secondary feeder	250,000 - 500,000	0.54	10.49	0.73%
469	Wangara to Whitfords Stn	Secondary feeder	20,000 - 50,000	0.60	9.48	0.07%
470	Burns Beach to Joondalup Stn	Secondary feeder	50,000 - 100,000	0.82	6.99	0.14%
471	Kinross to Joondalup Stn	Secondary feeder	20,000 - 50,000	0.61	9.32	0.13%
473	Kinross to Joondalup Stn	Secondary feeder	20,000 - 50,000	0.41	13.90	0.16%
474	Clarkson Stn to Joondalup Stn	Secondary feeder	50,000 - 100,000	1.15	4.98	0.09%
480	Butler Stn to Clarkson Stn	Secondary feeder	100,000 - 250,000	0.80	7.10	0.39%
481	Quinns Rocks to Clarkson Stn	Primary feeder	100,000 - 250,000	0.88	6.50	0.37%
482	Butler Station to Clarkson Stn	Secondary feeder	100,000 - 250,000	0.71	8.00	0.44%
483	Alkimos to Clarkson Stn	Primary feeder	250,000 - 500,000	0.90	6.35	0.64%
484	Alkimos to Clarkson Stn	Primary feeder	100,000 - 250,000	0.73	7.80	0.51%
490	Two Rocks to Butler Stn	Primary feeder	100,000 - 250,000	0.55	10.46	0.52%
491	Yanchep to Butler Stn	Secondary feeder	100,000 - 250,000	0.43	13.41	0.36%
500	Booragoon Stn to Bull Creek Stn	Secondary feeder	20,000 - 50,000	0.74	7.34	0.08%
501	Fremantle Stn to Bull Creek Stn	Primary feeder	750,000 - 1,000,000	1.54	3.52	0.79%
502	Fremantle Stn to Bull Creek Stn	Primary feeder	250,000 - 500,000	1.26	4.32	0.48%
503	Murdoch Stn to Bull Creek Stn	Secondary feeder	50,000 - 100,000	0.61	8.92	0.16%
504	Murdoch Stn to Bull Creek Stn	Secondary feeder	50,000 - 100,000	0.65	8.37	0.16%
505	Murdoch Stn to Bull Creek Stn	Secondary feeder	50,000 - 100,000	0.97	5.63	0.10%
506	Bull Creek Stn to Parkwood	Secondary feeder	50,000 - 100,000	1.56	3.87	0.08%
507	Cannington Stn to Bull Creek Stn	Primary feeder	750,000 - 1,000,000	0.98	6.17	1.32%
508	Cannington Stn to Bull Creek Stn	Primary feeder	250,000 - 500,000	0.98	6.16	0.71%
509	Cannington Stn to Bull Creek Stn	Secondary feeder	100,000 - 250,000	1.39	4.34	0.29%
510	Murdoch Stn to Booragoon Bus Stn	Secondary feeder	100,000 - 250,000	1.10	4.96	0.17%
511	Fremantle Stn to Murdoch Stn	Secondary feeder	250,000 - 500,000	0.86	6.33	0.45%
512	Spearwood to Murdoch Stn	Secondary feeder	100,000 - 250,000	0.65	8.32	0.31%
513	Fremantle Stn to Murdoch Stn	Secondary feeder	250,000 - 500,000	1.00	5.44	0.48%
514	Cockburn Central Stn to Murdoch Stn	Secondary feeder	100,000 - 250,000	0.53	10.22	0.37%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
515	Jandakot to Murdoch Stn	Secondary feeder	100,000 - 250,000	1.24	4.86	0.14%
516	Willetton to Challenger Murdoch	Secondary feeder	100,000 - 250,000	0.84	7.20	0.22%
517	Thornlie Stn to Challenger Murdoch	Secondary feeder	250,000 - 500,000	0.81	7.46	0.51%
518	Cockburn Central Stn to Challenger Murdoch	Secondary feeder	250,000 - 500,000	0.83	7.27	0.68%
519	Armadale Stn to Challenger Murdoch	Secondary feeder	100,000 - 250,000	0.63	9.51	0.48%
520	Fremantle Stn to Cockburn Central Stn	Secondary feeder	250,000 - 500,000	0.73	7.48	0.68%
522	Spearwood to Cockburn Central Stn	Community link	0 - 20,000	0.39	13.81	0.03%
525	Hammond Park to Cockburn Central Stn	Secondary feeder	100,000 - 250,000	1.31	4.15	0.17%
526	Hammond Park to Cockburn Central Stn	Secondary feeder	100,000 - 250,000	1.20	4.52	0.18%
527	Wandi to Cockburn Central Stn	Primary feeder	250,000 - 500,000	1.47	4.12	0.51%
530	Fremantle Stn to Cockburn Central Stn	Primary feeder	250,000 - 500,000	0.82	6.63	0.74%
531	Fremantle Stn to Cockburn Central Stn	Secondary feeder	100,000 - 250,000	0.62	8.79	0.59%
532	Fremantle Stn to Cockburn Central Stn	Secondary feeder	250,000 - 500,000	0.67	8.16	0.60%
540	Kwinana Bus Stn to Kwinana Stn	Secondary feeder	50,000 - 100,000	0.76	6.77	0.16%
541	Wellard Stn to Kwinana Stn	Secondary feeder	100,000 - 250,000	0.77	6.68	0.22%
542	Wellard Stn to Kwinana Stn	Secondary feeder	50,000 - 100,000	0.75	6.86	0.17%
543	Kwinana Bus Stn to Kwinana Stn	Secondary feeder	100,000 - 250,000	1.35	3.81	0.15%
548	Rockingham Stn to Fremantle Stn	Secondary feeder	100,000 - 250,000	0.36	14.24	0.43%
549	Rockingham Stn to Fremantle Stn	Full time daily	500,000 - 750,000	0.56	9.18	1.25%
550	East Rockingham to Rockingham Stn	Secondary feeder	50,000 - 100,000	0.81	6.33	0.09%
551	Shoalwater to Rockingham Stn	Secondary feeder	100,000 - 250,000	0.67	7.68	0.23%
552	Shoalwater to Rockingham Stn	Secondary feeder	100,000 - 250,000	0.82	6.27	0.19%
553	Shoalwater to Rockingham Stn	Secondary feeder	20,000 - 50,000	0.48	10.60	0.11%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
554	Rockingham Stn to Rockingham Stn	Secondary feeder	0 - 20,000	0.36	14.14	0.04%
555	Rockingham Beach to Rockingham Stn	Primary feeder	250,000 - 500,000	1.51	3.41	0.27%
556	Rockingham Hospital to Rockingham Stn	Secondary feeder	20,000 - 50,000	0.74	6.92	0.05%
557	Warnbro Stn to Rockingham Stn	Secondary feeder	100,000 - 250,000	0.62	8.29	0.24%
558	Mandurah Stn to Rockingham Stn	Secondary feeder	500,000 - 750,000	0.75	6.87	1.18%
559	Secret Harbour to Rockingham Stn	Secondary feeder	50,000 - 100,000	0.98	5.23	0.12%
560	Port Kennedy to Warnbro Stn	Secondary feeder	100,000 - 250,000	0.76	6.78	0.24%
561	Secret Harbour to Rockingham Stn	Secondary feeder	100,000 - 250,000	0.69	7.41	0.43%
562	Warnbro Stn to Rockingham Stn	Secondary feeder	100,000 - 250,000	0.83	6.21	0.27%
563	Secret Harbour to Warnbro Stn	Secondary feeder	100,000 - 250,000	0.49	10.42	0.32%
564	Baldivis to Warnbro Stn	Secondary feeder	50,000 - 100,000	0.71	7.20	0.17%
565	Baldivis to Warnbro Stn	Secondary feeder	100,000 - 250,000	0.90	5.70	0.19%
566	Baldivis to Warnbro Stn	Secondary feeder	50,000 - 100,000	0.52	9.92	0.18%
567	Baldivis to Warnbro Stn	Secondary feeder	50,000 - 100,000	0.65	7.93	0.19%
568	Baldivis to Warnbro Stn	Secondary feeder	50,000 - 100,000	0.74	6.95	0.19%
584	Madora Bay to Mandurah Stn	Secondary feeder	50,000 - 100,000	0.51	10.00	0.24%
586	John Tonkin College to Mandurah Stn	Secondary feeder	20,000 - 50,000	2.56	2.00	0.02%
587	Lakelands to Mandurah Stn	Secondary feeder	100,000 - 250,000	0.90	5.73	0.24%
588	Mandurah Stn to Mandurah Stn	Primary feeder	100,000 - 250,000	1.44	3.56	0.18%
589	Mandurah Stn to Mandurah Stn	Primary feeder	100,000 - 250,000	1.26	4.09	0.17%
591	Mandurah Stn to Erskine	Secondary feeder	100,000 - 250,000	0.58	8.78	0.32%
592	Mandurah Stn to Wannanup	Secondary feeder	100,000 - 250,000	0.53	9.65	0.31%
593	Mandurah Stn to Dawesville West	Secondary feeder	100,000 - 250,000	0.59	8.77	0.36%
594	Mandurah Stn to Dawesville West	Primary feeder	100,000 - 250,000	0.61	8.48	0.45%
597	Mandurah Stn to Coodanup	Secondary feeder	50,000 - 100,000	0.50	10.17	0.16%
598	Mandurah Stn to Greenfields	Secondary feeder	50,000 - 100,000	0.54	9.53	0.17%
600	Pinjarra to Mandurah Stn	Secondary feeder	50,000 - 100,000	0.54	9.44	0.19%

Bus route	Start/end	Service type	Passenger boardings	Passenger boardings (per km)	Cost per boarding (\$)	% of total costs
604	South Yunderup to Mandurah Stn	Rural	0 - 20,000	0.27	18.74	0.02%
605	Pinjarra West to Mandurah Stn	Rural	0 - 20,000	0.91	5.63	0.01%
910	Fremantle Station to Elizabeth Quay Bus Station	SuperBus	1,000,000 - 2,000,000	1.17	4.65	1.64%
930	Thornlie Station to Elizabeth Quay Bus Station	SuperBus	1,000,000 - 2,000,000	1.10	5.63	1.71%
935	Perth Airport T3/T4 to Kings Park	SuperBus	500,000 - 750,000	1.03	5.76	1.01%
950	Morley Bus Station to QEII Medical Centre	SuperBus	3,000,000 - 4,000,000	2.84	2.23	2.43%
955	Ellenbrook to Morley Bus Station	Primary feeder	500,000 - 750,000	0.96	5.67	0.85%
956	Ellenbrook North to Bassendean Stn	Secondary feeder	250,000 - 500,000	0.84	6.51	0.49%
960	Mirrabooka Bus Stn to Curtin University Bus Stn	SuperBus	500,000 - 750,000	0.96	6.32	1.04%
970	Mirrabooka Bus Stn to Perth Busport	SuperBus	250,000 - 500,000	1.33	4.30	0.48%
990	Scarborough Beach to Perth Busport	SuperBus	1,000,000 - 2,000,000	1.43	4.48	1.51%
998	CircleRoute (Clockwise) via Stirling, Morley, Belmont and Murdoch	Full time daily	2,000,000 - 3,000,000	1.31	4.26	2.57%
999	CircleRoute (Anti-clockwise) via Murdoch, Belmont, Morley and Stirling	Full time daily	2,000,000 - 3,000,000	1.32	4.25	2.47%

Auditor General's reports

Report number	2017 reports	Date tabled
22	Minimising Drugs and Alcohol in Prisons	8 November 2017
21	Audit Results Report – Annual 2016-17 Financial Audits	7 November 2017
20	Financial Controls – Focus Area Audits 2016-17	7 November 2017
19	Opinion on Ministerial Notification	1 November 2017
18	Diverting Young People Away From Court	1 November 2017
17	Management of Pastoral Lands in Western Australia	11 October 2017
16	Rich and Rare: Conservation of Threatened Species Follow-up Audit	6 September 2017
15	Opinion on Ministerial Notification	6 September 2017
14	Non-Clinical Services at Fiona Stanley Hospital	16 August 2017
13	Audit of Journal Entries and Property, Plant and Equipment Using Data Analytic Procedures	19 July 2017
12	Information Systems Audit Report	29 June 2017
11	Opinion on Ministerial Notification	29 June 2017
10	Timely Payment of Suppliers	21 June 2017
9	Opinion on Ministerial Notification	8 June 2017
8	Management of Medical Equipment	25 May 2017
7	Audit Results Report – Annual 2016 Financial Audits – Universities and TAFEs – Other audits completed since 1 November 2016	11 May 2017
6	Opinions on Ministerial Notifications	13 April 2017
5	Accuracy of WA Health's Activity Based Funding Data	11 April 2017
4	Controls Over Purchasing Cards	11 April 2017
3	Tender Processes and Contract Extensions	11 April 2017
2	Opinion on Ministerial Notification	6 April 2017
1	Opinion on Ministerial Notification	30 March 2017

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