

---

**New South Wales Auditor-General's Report**  
Performance Audit

**Passenger rail punctuality**

Transport for NSW, Sydney Trains, NSW Trains

---



## The role of the Auditor-General

The roles and responsibilities of the Auditor-General, and hence the Audit Office, are set out in the *Public Finance and Audit Act 1983*.

Our major responsibility is to conduct financial or 'attest' audits of State public sector agencies' financial statements. We also audit the Total State Sector Accounts, a consolidation of all agencies' accounts.

Financial audits are designed to add credibility to financial statements, enhancing their value to end-users. Also, the existence of such audits provides a constant stimulus to agencies to ensure sound financial management.

Following a financial audit the Audit Office issues a variety of reports to agencies and reports periodically to parliament. In combination these reports give opinions on the truth and fairness of financial statements, and comment on agency compliance with certain laws, regulations and government directives. They may comment on financial prudence, probity and waste, and recommend operational improvements.

We also conduct performance audits. These examine whether an agency is carrying out its activities effectively and doing so economically and efficiently and in compliance with relevant laws. Audits may cover all or parts of an agency's operations, or consider particular issues across a number of agencies.

As well as financial and performance audits, the Auditor-General carries out special reviews and compliance engagements.

Performance audits are reported separately, with all other audits included in one of the regular volumes of the Auditor-General's Reports to Parliament – Financial Audits.

[audit.nsw.gov.au](http://audit.nsw.gov.au)



© Copyright reserved by the Audit Office of New South Wales. All rights reserved. No part of this publication may be reproduced without prior consent of the Audit Office of New South Wales.

The Audit Office does not accept responsibility for loss or damage suffered by any person acting on or refraining from action as a result of any of this material.



GPO Box 12  
Sydney NSW 2001

The Legislative Assembly  
Parliament House  
Sydney NSW 2000

The Legislative Council  
Parliament House  
Sydney NSW 2000

In accordance with section 38E of the *Public Finance and Audit Act 1983*, I present a report titled **Passenger rail punctuality: Transport for NSW, Sydney Trains, NSW Trains**.

A handwritten signature in black ink, appearing to read 'Margaret Crawford'.

**Margaret Crawford**

Auditor-General

11 April 2017

# Contents

---

<b>Contents</b>	<b>1</b>
<b>Executive summary</b>	<b>2</b>
Conclusion	2
Recommendations	4
<b>Introduction</b>	<b>5</b>
Background	5
<b>Key findings</b>	<b>7</b>
1. Measuring punctuality	7
2. Punctuality performance	12
3. Maintaining punctuality in the future	16
<b>Appendices</b>	<b>26</b>
Appendix 1: Response from the agencies	26
Appendix 2: Response from Audit Office	28
Appendix 3: About the audit	29
Appendix 4: Accuracy of punctuality measurement	31
Appendix 5: Train and customer punctuality	32
<b>Performance auditing</b>	<b>36</b>

# Executive summary

---

A NSW Government priority is to ‘maintain or improve reliability of public transport services over the next four years’. Punctuality is a key element of reliability, and the level of patronage is a critical factor in the ability to maintain punctuality. Increasing patronage places pressure on the length of time trains need to wait at stations to load and offload passengers which can lead to delays. The NSW Long Term Transport Master Plan forecasts that rail patronage could increase by 26 per cent between 2012 and 2031.

Passenger rail services in NSW are provided under a purchaser-provider model. Transport for NSW enters contracts with:

- Sydney Trains for Sydney suburban passenger rail services
- NSW Trains for services that commence or terminate outside Sydney, including intercity services that operate between Central station and the South Coast, Southern Highlands, Blue Mountains and Central Coast and Newcastle.

Transport for NSW sets performance targets and standards for these services, develops the timetables, procures trains for the service providers, and is responsible for long term planning.

This audit assessed whether these rail agencies have plans and strategies to maintain or improve performance in getting the growing number of suburban and intercity rail passengers to their destinations on time.

## Conclusion

Rail agencies are well placed to manage the forecast increase in passengers up to 2019, including joining the Sydney Metro Northwest to the network at Chatswood. Their plans and strategies are evidence-based, and mechanisms to assure effective implementation are sound.

Based on forecast patronage increases, the rail agencies will find it hard to maintain punctuality after 2019 unless the capacity of the network to carry trains and people is increased significantly. If recent higher than forecast patronage growth continues, the network may struggle to maintain punctuality before 2019.

Transport for NSW has undertaken considerable work on developing strategies to increase capacity and maintain punctuality after 2019, but remains some way from putting a costed plan to the government. There is a significant risk that investments will not be made soon enough to handle future patronage levels. Ideally, planning and investment decisions should have been made already.

### **Punctuality measurement is satisfactory, but agencies could publish more information**

Passenger rail punctuality indicators adopted in NSW are good practice. The key train punctuality indicator is better than indicators used by many other rail operators. It is also better than the on-time-running indicator that it replaced. Unlike the on-time-running indicator, the punctuality indicator classifies trains that have been cancelled or skipped stations as late and results are not adjusted to take account of delays caused by factors such as extreme weather or police operations.

NSW also has a customer delay measure which represents good practice. Work has started on refining and embedding customer delay as a key performance measure for the planned new Rail Operations Centre.

As train frequency approaches a ‘turn up and go’ level of service, rather than running to a timetable, more emphasis will need to be placed on excess waiting time and customer delay when assessing performance.

Measurement of punctuality is reasonably precise. There are some measurement inaccuracies which should be addressed, such as the estimated arrival time of a train being incorrect at some destination stations, but these do not affect punctuality results materially.

Train punctuality is reported publicly, but not to the detail of the indicators in the contracts between Transport for NSW and Sydney Trains and NSW Trains. There is very limited public reporting of customer delay.

### **Overall punctuality is good, but some services are relatively poor**

System-wide train punctuality has usually exceeded target since 2005, but some services suffer from poor punctuality compared to the rest of the network.

The part of the network around North Sydney is creating problems for the punctuality of afternoon peak services heading through it and out to Western Sydney and to Hornsby via Strathfield. Transport for NSW and Sydney Trains are well advanced with strategies to address this up to 2019.

The East Hills express trains in the afternoon peak also performed well below target. The rail agencies recently analysed this issue and believe it relates to the train timetable and signalling which restricts how close trains can run behind each other into Campbelltown. It further advises that this will be corrected over the next three years.

Intercity train punctuality is below that of suburban trains and there was an extended period of declining punctuality between 2011 and 2014. Transport for NSW suggested that the old age of trains is a factor, and the recently announced intercity fleet acquisition may help address this. Apart from ensuring that train crew and station staff are available and perform their duties adequately, NSW Trains can do little to impact the punctuality of its intercity services directly. Train maintenance, track and signal maintenance, and management of trains on the rail network are performed by Sydney Trains. NSW Trains' ability to influence improvement is hampered by key indicators in some contracts being undefined. Transport for NSW, Sydney Trains and NSW Trains are now working collaboratively to make improvements to the contracts.

### **Initiatives are in place or are planned to deliver good punctuality until 2019**

Patronage increases, which can lead to overcrowding and trains having to wait longer at stations, are likely to present a significant challenge to maintaining punctuality into the future.

Based on patronage projections, the rail agencies have strategies to maintain punctuality up to and including joining the Sydney Metro Northwest to the network at Chatswood in 2019. These include improving infrastructure at particular parts of the network, increasing staff training, reducing the number of speed restrictions, and a new Rail Operations Centre. The projects are being managed by experienced staff, with good governance arrangements, quality assurance processes and planning systems in place. New timetables should provide more services and cater for more passengers, including off peak. They should increase network efficiency through better utilisation of capacity, but some passengers may face longer journey times and more may need to change trains mid-journey.

The planned Rail Operations Centre has the potential to make operational decision-making more customer-focussed, by placing more emphasis on minimising customer delay during disruptions. If implemented well, it will also generate information to help agencies better identify the root cause of incidents that delay trains and improve communication with passengers so they can make better real-time travel decisions.

### **Predicted passenger growth presents a risk to punctuality after 2019**

The rail system will struggle to maintain punctuality much beyond 2019 based on current patronage forecasts and system limitations.

From 2024, the Sydney Metro City and Southwest will help by extending the metro network from Chatswood under Sydney Harbour, through the city and out to Bankstown. Announced fleet upgrades will also help. Transport for NSW advises that it is also working with the

Greater Sydney Commission to ensure network capacity constraints are considered in future urban planning.

In addition to investment in new metro networks, sustained and substantial investment needs to be made into the existing heavy rail network to meet demand and ensure its ongoing reliability. Transport for NSW has been developing strategies for this purpose, including an Advanced Train Control system. Its aim is to put a costed plan to the government by the third quarter of this (2017) calendar year. Given the likely lead times involved with major infrastructure projects, there remains a significant risk of poor punctuality after 2019.

### **Punctuality could be at risk sooner if recent patronage growth continues**

If patronage continues to increase at a faster rate than forecast, particularly during the morning peak, the network will struggle to cope before 2019. Transport for NSW forecast that between 2011 and 2026 morning peak rail patronage would increase each year by approximately 3.3 per cent. Between 2011 and 2016 the number of passengers travelling to the city during the morning peak grew by an average of 4.4 per cent each year, including annual growth of 6.6 per cent since May 2014.

A good understanding of patronage levels, trends and drivers is critical to effective planning. The audit identified some shortcomings in measurement of peak passenger loads. Transport for NSW advised that measurement approaches have been improved recently, and this will soon flow into improved data quality.

Given the increasing flexibility in work practices available to many city workers, the relatively new field of behavioural insights may offer opportunities to 'nudge' some passengers away from travelling at the height of the peak with benefits for them and the network.

## **Recommendations**

1. Transport for NSW should ensure that programs to address rail patronage growth over the next five to ten years are provided to the government for Cabinet consideration as soon as possible.
2. Sydney Trains and Transport for NSW should:
  - a) maintain effective oversight and resourcing for all strategies designed to address rail patronage growth
  - b) adjust strategies for any patronage growth above projection.
3. Sydney Trains, NSW Trains and Transport for NSW should publish Customer Delay results by June 2018.
4. Transport for NSW, Sydney Trains and NSW Trains should agree by December 2017:
  - a) specific performance requirements for intercity train, track and signal availability and reliability
  - b) guidelines for train priorities during disruptions and indicators of control centre performance in implementing these guidelines.
5. Sydney Trains, NSW Trains and Transport for NSW should by June 2018:
  - a) improve the accuracy of patronage measurement and develop a better understanding of patronage growth trends
  - b) address small errors in the adjustment factors used for determining a train's punctuality status
  - c) improve their understanding of the factors impacting on intercity punctuality.
6. Transport for NSW should, commencing June 2017, explore the potential to use behavioural insights to encourage more passengers to travel outside the height of the morning peak (8 am to 9 am).

# Introduction

---

## Background

### **Railways are critical and punctuality is a priority**

Railways are an integral part of Sydney's transport network. On a typical weekday, trains deliver 44 per cent of employees in the North Sydney-Sydney CBD-Redfern area to their jobs. About 120,000 people exit the stations that serve this area between 8 am to 9 am, the height of the morning peak.

In 2015–16, there were approximately 360 million passenger journeys on suburban and intercity trains. The train network improves mobility, accessibility and connectivity for residents.

A NSW Government priority is to 'maintain or improve reliability of public transport services over the next four years'. Maintaining punctuality of passenger rail services is a key element in providing a reliable transport service.

### **Patronage growth is a challenge for maintaining punctuality**

The level of patronage is a critical factor in the ability to maintain punctuality. Increasing patronage can lead to overcrowding, increasing the time it takes passengers to get off and on the train. If this time exceeds the waiting time allowed for in the timetable, delays will start to occur.

The NSW Long Term Transport Master Plan forecasts that rail patronage could increase by 26 per cent between 2012 and 2031.

### **Transport for NSW procures rail services from Sydney Trains and NSW Trains**

The *Passenger Transport Act 2014* provides that contracts are required for the procurement of passenger transport services. The *Transport Administration Act 1988* sets out the functions of, and relationships between, transport agencies.

Transport for NSW, under a purchaser-provider model, enters into contracts with service providers. It has entered into separate contracts (Rail Services Contract) with Sydney Trains and NSW Trains to procure passenger rail services. Transport for NSW sets performance targets and service standards for these transport services. Other key functions of Transport for NSW are planning for the future, timetabling of transport services and procurement of transport infrastructure including rolling stock (train carriages).

Sydney Trains provides railway passenger services in the Sydney Metropolitan Area. Its services extend to Cronulla, Waterfall, Macarthur, Leppington, Emu Plains, Richmond, Berowra and Bondi Junction and are referred to as 'suburban services'. In addition, Sydney Trains manages and maintains rail infrastructure in the area bounded by Bomaderry (South Coast), Macarthur, Lithgow (Blue Mountains), Richmond and Islington Junction (Newcastle).

NSW Trains provides railway passenger services that commence or terminate outside the Sydney Metropolitan Area. This includes the 'intercity services' that operate between Central station and the South Coast, Southern Highlands, Blue Mountains and Central Coast and Newcastle.

## Putting the customer at the centre of everything is also a priority

In November 2011, when announcing the establishment of Transport for NSW, the then Minister for Transport stated that ‘the customer will be at the centre of everything we do’.

The first objective of the:

- *Transport Administration Act 1988* is ‘to put the customer first and design the transport system around the needs and expectations of the customer’
- *Passenger Transport Act 2014* is ‘to facilitate the delivery of safe, reliable, efficient and integrated public passenger services that are responsive to customer needs’.

## What is this audit about?

This audit assessed whether rail agencies have plans and strategies to maintain or improve performance in getting the growing number of rail passengers to their destinations on time. In particular, it considered whether rail agencies have:

- reliable information on performance in getting rail passengers to their destinations on time, and are taking or planning remedial action to address any performance shortcomings
- developed plans and strategies to get the predicted increased number of rail passengers to their destinations on time in future
- plans to improve communication to assist passengers get to their destinations on time.

The audit focussed on suburban services operated by Sydney Trains and intercity services operated by NSW Trains. It looked at punctuality from the perspectives of both train operations and customers.

The agencies’ responses to the audit report are at Appendix 1. Further information on the audit scope and criteria is at Appendix 2.



# Key findings

## 1. Measuring punctuality

**The rail agencies measure punctuality reasonably well. They could publish more detailed results sooner after they occur, particularly for the customer delay measure.**

The key performance indicators of punctuality used by the NSW rail agencies are better practice. Transport for NSW's Rail Services Contracts with both Sydney Trains and NSW Trains include indicators for both train punctuality and customer punctuality.

Reported train and customer punctuality are reasonably precise. There are some measurement inaccuracies which should be addressed, such as the estimated arrival time of a train being incorrect at some destination stations. These do not affect punctuality results materially, but could do so in future if not addressed.

Train punctuality for suburban and intercity trains is reported on the Sydney Trains website although not to the detail in the Rail Services Contracts. There is very limited public reporting of customer punctuality (called Customer Delay in the Rail Services Contracts).

As rail service frequency increases towards a 'turn up and go' service, from a customer perspective the relevance of a timetable declines. In future, more emphasis will need to be placed on measures of excess waiting time and customer delay when assessing performance. Work has started on refining and embedding the minimisation of customer delay as a key performance measure for the planned new Rail Operations Centre.

### Recommendations

Sydney Trains, NSW Trains and Transport for NSW should:

- publish Customer Delay results
- address small errors in the adjustment factors used for determining a train's punctuality status.

### 1.1 Punctuality indicators

#### A better practice indicator of train punctuality is in place

On 1 July 2013, NSW passenger rail agencies moved from an 'on-time-running' indicator to a train 'punctuality' indicator. The punctuality indicator is better than the previous on-time-running indicator for several reasons, and better than that used in most other rail systems.

A train is 'punctual' if it:

- stopped at all the stations at which it was listed to stop in the timetable
- arrived at its destination no later than its arrival time as listed in the timetable plus an on-time tolerance.

The on-time tolerance is five minutes for suburban and six minutes for intercity services.

Train operators occasionally direct a train driver to skip a station to make up lost time. Prior to 1 July 2013, a train that skipped a station, or stations, could still be classified as 'on-time' if it reached its destination within the on-time tolerance.

Punctuality results are not adjusted for events beyond the control of the train operator such as significant weather events and police operations. On-time-running results were adjusted for such events. Punctuality results more closely reflect the actual customer experience.

Peak punctuality is measured for a longer period each week day than was on-time-running. The morning peak period is now 6 am to 10 am (formerly 6 am to 9 am) and the afternoon peak is now 3 pm to 7 pm (formerly 4 pm to 6 pm). These better align with observed customer travel patterns and are consistent with a 2005 recommendation of the Auditor-General.

### A customer punctuality indicator is in place, which is leading practice

The two Rail Services Contracts include a Customer Delay Measure. Some form of customer delay measure is leading practice and is even more representative of the customer experience than the current punctuality indicator.

The Customer Delay Measure estimates the difference between the expected and actual time of arrival at each customer's destination station and calculates an average delay from this. It:

- takes into account all the customer inconveniences that can occur during daily train operations (such as early and late trains, trains out of timetable order, skipped stops, cancellations)
- recognises that a passenger can reach their destination close to time despite trains running late and out of timetable order
- aligns with Transport for NSW's customer value proposition research which found customers' highest priorities were train frequency, keeping to schedules and total travel time
- is a customer outcome measure and, as such, can be used to inform transport policy
- could be measured for other modes of transport allowing legitimate between mode comparisons.

### Exhibit 1: Punctuality of trains and customer delay hypotheticals

#### Poor train punctuality, but low customer delay

Trains in the CBD are running ten minutes late due to a previous incident. Train punctuality is therefore zero. But trains are arriving every three minutes and passengers are getting to their destinations on time.

#### Increased customer delay through maximising train punctuality

One train has many passengers but is quite late. Another train has a handful of passengers but is on time. Giving priority to the train with a handful of passengers would maximise punctuality results, but result in longer customer delay.

Source: Audit Office analysis

The London Underground has customer measures called Excess Journey Time and Lost Customer Hours which are similar to the Customer Delay Measure. Very few other rail operators publish customer outcome measures. Independent transport commentators have expressed disappointment about the domination of on-time-running over customer outcome measures.

A customer outcome indicator of punctuality was recommended by the Independent Transport Safety and Reliability Regulator in 2004 and the Auditor-General in 2005.

Train Punctuality and the Customer Delay Measure provide different perspectives which are both important for decision making and planning.

### Increasing emphasis on measuring and managing customer punctuality

Transport for NSW, Sydney Trains and NSW Trains are each giving increasing emphasis to measuring and managing for customer outcomes. This is a positive development towards the priority of 'putting the customer at the centre of everything they do'.

The train punctuality indicator is clearly still the primary indicator for NSWs' rail agencies. Indicators of train punctuality have been used and reported by most railway operators for decades. Indicators of customer punctuality are rare, a very recent innovation and do not have

the profile of train punctuality. Technology and information is becoming available for better estimating and communicating customer delay in real time. We noted that:

- Transport for NSW is undertaking development work on further refining the Customer Delay Measure
- the rail agencies are jointly examining other potential indicators of customer delay to better inform planning and allocation of resources
- NSW Trains has incorporated the Customer Delay Measure outcomes into its weekly management reviews of operational performance.

### Excess wait time may replace punctuality as we move to 'turn up and go' services

As train frequencies increase in response to future demand, rail agencies will need to consider an alternative to the current measure of train punctuality. As 'turn up and go' services replace timetabled services, adherence to timetable (i.e. train punctuality) becomes redundant and unexpected/excess wait time becomes more relevant.

The Transport and Infrastructure Council has reported that the part of the journey least appealing to customers is waiting for a train longer than expected. A customer wait time measure is:

- highly recommended by transport researchers
- supported by Transport for NSW's customer value proposition research
- in use by some operators (for example, Transport for London with respect to their bus network).

## 1.2 Accuracy of punctuality measurement

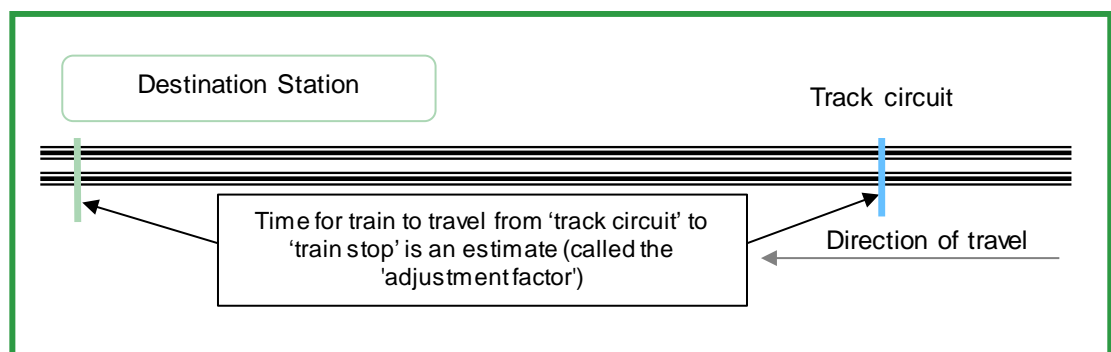
### Reported train punctuality is a reasonable estimate of actual punctuality

Train punctuality is measured by comparing the location of a train to its timetabled location. The system used to measure punctuality is primarily in place for safe train management.

The current method involves some estimation, as measurement points (typically a track circuit) are rarely located at destination stations. This is illustrated in Exhibit 2.

The estimation approach currently used is satisfactory. Repeated observations by fieldworkers with stopwatches are used to calculate an 'adjustment factor' for each station platform at which trains terminate.

#### Exhibit 2: Representation of estimate of arrival time of a train at a station



Source: Audit Office's expert adviser

### There are some measurement inaccuracies, but they are not material

Some adjustment factors have become inaccurate because they have not been re-estimated after technology upgrades. The effect on overall train punctuality is not material, but if this is not addressed they could become material as further technology upgrades occur.

From time to time signalling systems and other track circuitry are upgraded. Upgrades impact on the time trains take to get from the measurement point to the station. Adjustment factors

have not been re-estimated following some upgrades. The adjustment factors reverted to zero at ten suburban and four intercity destination stations. This could result in a 'late' train being classified as 'punctual'. Our analysis indicated that very few trains would fall into this category. We calculated that 99.2 per cent of punctual suburban trains arrived within 4 minutes and 30 seconds of their timetabled arrival time. The number of late trains that were measured as punctual would be less than 0.7 per cent, because it is unlikely that these would have all been 'late' in reality.

The 'adjustment factors' at the remaining destination stations have not been reviewed since at least early 2012. These should be reviewed regularly to account for time savings from upgrades like new and faster rolling stock and removal of speed restrictions. The use of out-of-date adjustment factors means some trains arrived earlier than actually estimated. Again, our analysis indicated that very few trains fell into this category. In March 2016, only 0.6 per cent of trains arrived at their destination between 5 minutes and 5 minutes and 30 seconds late. Only a proportion of these would have been deemed late despite being punctual. This is illustrated in Appendix 3.

The situation is similar for intercity trains. The destination of approximately 92 per cent of afternoon peak trains on the Blue Mountains Line is one of the four stations for which the adjustment factor has defaulted to zero. The Blue Mountains Line has better reported punctuality during the afternoon peak than other intercity lines.

Using the same analytical approach applied to suburban trains, we concluded that the difference between actual and reported punctuality of intercity trains was also not significant.

The Customer Delay Measure is based on the same data and as such would also have some inaccuracies, but these are also unlikely to be material.

Errors in reported punctuality are unlikely to be significant, but could be reduced by:

- documenting and implementing a protocol for regular review of 'adjustment factors', particularly linked to fleet and network upgrades
- collaborating with others in the transport portfolio who are also estimating arrival time of a train at a station for other purposes, such as determining train running times between stations.

We considered the need for alternative measurement systems such as Global Positioning System (GPS) tracking and monitoring. Such systems are feasible, and GPS is being utilised in a limited way on some parts of the intercity and regional networks. GPS still needs supporting systems to transfer data to a central location from trains and to compare actual to timetabled location. Further, GPS repeater technology would be needed where services operate underground. Given the current measurement approach does not have material errors, we do not think a wholesale adoption of GPS is necessary or likely to represent value for money. Further, as discussed later in this report, Transport for NSW is moving in time to an Advanced Train Control system which will improve the accuracy of data on train location.

### **1.3 Transparency of punctuality results**

#### **Train punctuality results could be reported publicly in more detail**

Train punctuality for suburban and intercity trains is reported on the Sydney Trains website but not to the detail of the key performance indicators in the contracts between Transport for NSW and Sydney Trains and NSW Trains.

The punctuality of suburban and intercity services in the morning and afternoon peak periods is published on the Sydney Trains website. The level of reporting is reasonable.

The Rail Services Contracts require Sydney Trains and NSW Trains to provide further and more detailed punctuality results to Transport for NSW than reported publicly. For example:

- punctuality at non-Sydney central business district business centres (Chatswood, Liverpool, Parramatta and Penrith) is reported to Transport for NSW but not published
- separate morning peak and afternoon peak monthly punctuality results are reported to Transport for NSW but these are combined into a single 'peak' result when published.

### **Public reporting of customer delay results is very limited**

No reference to the Customer Delay Measure is on any agency website apart from a single figure, representing average customer delay for intercity services across a financial year, in the NSW Trains annual reports.

The Customer Delay Measure is relatively new compared to train punctuality measures. Arguably it has been appropriate to give it a lower reporting profile while:

- staff and stakeholders developed an understanding of its definition, benefits, uses and the insights that it provides beyond the train punctuality indicator
- technology and information improved to the point where real time measurement and reporting was practical.

## 2. Punctuality performance

**Train punctuality at the network level has been good since 2005, but some services and lines perform poorly compared to others in the afternoon peak. In some cases, rail agencies have a good understanding of the reasons and are implementing remedial strategies. In others, they are working to understand the reasons for the relatively poor punctuality.**

Train punctuality overall has been good for several years, but there are some underperforming areas during the afternoon peak. These include the East Hills, Western and Northern via Strathfield lines and all intercity lines.

Rail agencies had a good understanding of causes of the relatively poor punctuality of afternoon trains travelling on the Western and Northern via Strathfield lines and are well advanced with strategies to address this up to 2019.

The East Hills express trains in the afternoon peak also performed well below target. The rail agencies recently analysed this issue and believe it relates to the train timetable and signalling which restricts how close trains can run behind each other into Campbelltown. It further advises that this will be corrected over the next three years.

The punctuality of intercity trains started to deteriorate in mid-2011 and intercity punctuality does not usually recover between the morning and afternoon peaks whereas suburban punctuality usually recovers. The agencies were not able to demonstrate a thorough understanding of the reasons this situation. Transport for NSW suggested the old age of the intercity fleet may be a factor and that the recently signed New Intercity Fleet contract should help improve punctuality.

NSW Trains' ability to improve its punctuality is constrained. It only controls train and station staff. It relies on Sydney Trains for management of trains from origin to destination and asset maintenance services. Weaknesses in current agreements limit its ability to influence service levels and priorities, but the rail agencies are now collaborating to address these.

### **Recommendation**

Transport for NSW, Sydney Trains and NSW Trains should:

- agree specific performance requirements for intercity train, track and signal availability and reliability
- agree guidelines for train priorities during disruptions and indicators of control centre performance in implementing these guidelines
- improve their understanding of the factors impacting on intercity punctuality.

### 2.1 Punctuality results

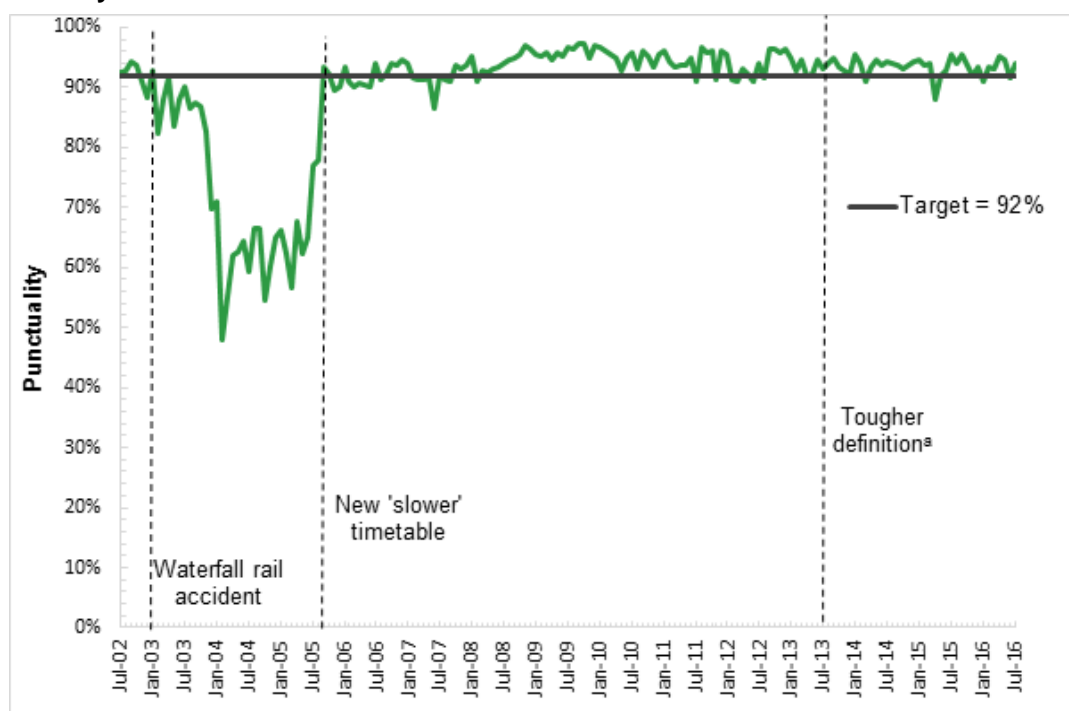
#### **Train punctuality has been good since 2005**

While train punctuality is measured for all timetabled trains, the Rail Services Contract target of 92 per cent applies to trains arriving at Central station in the morning peak (6 am to 10 am) and departing from Central station in the afternoon peak (3 pm to 7 pm) on Mondays to Fridays (excluding public holidays). This is also the basis for publicly reported punctuality results.

Overall, punctuality has generally exceeded 92 per cent since the introduction of a new, but slower, timetable in September 2005 in the aftermath of the Waterfall rail accident in January 2003.

Exhibit 3 shows the trend in train punctuality since July 2002. The impact on punctuality of the Waterfall rail accident is clearly evident and the decline in punctuality at that time was primarily due to train drivers operating at slower speeds than required by the timetable.

**Exhibit 3: Punctuality; Combined peaks, Suburban and Intercity; July 2002 to July 2016; Monthly**



<sup>a</sup> Tougher definition means change from on-time-running to the current punctuality indicator.

Source: Audit Office analysis of data from Sydney Trains' website.

We analysed in more detail the punctuality of all trains operating from 1 July 2015 to 31 March 2016. The analysis is summarised in Appendix 4. The percentages to which the 92 per cent contract targets apply are shaded.

In general, the contract target for train punctuality was met or exceeded by a relatively large margin. The notable exceptions were suburban trains on the Western line (87.6 per cent) and Northern via Strathfield line (89.0 per cent), and intercity trains in the afternoon peak (84.7 per cent).

For completeness, we analysed the punctuality of trains that do not operate to or from the city (such as the Cumberland line that operates between Campbelltown and Schofields). Punctuality levels on these lines were relatively high.

Other points to note are that train punctuality:

- during the morning peak is higher than during the afternoon peak
- of suburban trains is higher than punctuality of intercity trains
- of suburban trains overall at all times of the day is relatively good.

Appendix 4 shows the Customer Delay Measure outcomes from July 2015 to April 2016. The target is for at least 90 per cent of customers to have a delay of no more than 4 minutes. Those lines for which the target was not met are shaded.

The South, Western and Northern via Strathfield lines and all intercity lines did not meet the Customer Delay Measure target during the afternoon peaks in the period analysed. Sydney Trains' Customer Delay Measure averaged 3 minutes 1 second during the morning peak and 3 minutes 49 seconds during the afternoon peak.

We did not extend analysis of Customer Delay Measure beyond that in Appendix 4. Analysing Customer Delay Measure at a more detailed level is much more complex than analysing train punctuality because measurement is at the passenger rather than the train level. Transport for NSW is in the process of completing a proof-of-concept for a system to allow more in-depth analysis of Customer Delay Measure. Transport for NSW is also starting to incorporate Opal

data into the Customer Delay Measure model to provide superior information on customer travel patterns than available to date.

## 2.2 Less punctual lines and services

### Some suburban lines and services perform relatively poorly

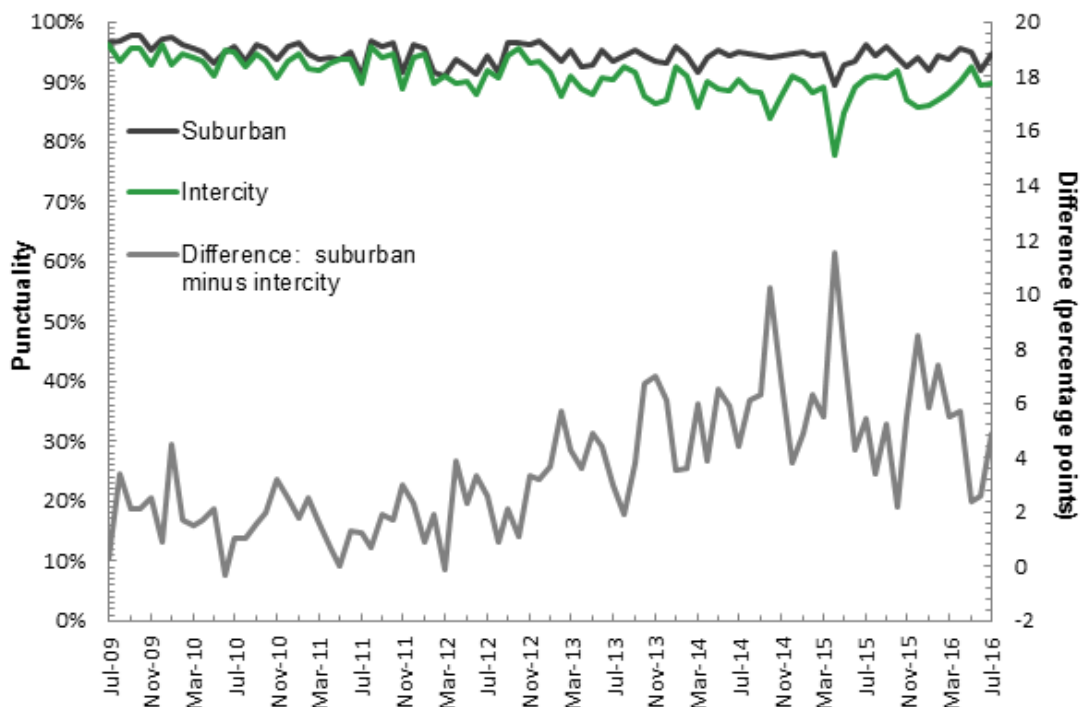
The punctuality of Western line and Northern via Strathfield line trains departing Central station between 5.15 pm and 6 pm was relatively poor. During these times of the day the average punctuality of trains on these two lines ranged from 58 per cent to 89 per cent across the period we analysed. The agencies demonstrated that the delays resulted largely from challenges in maintaining the punctuality of North Shore trains operating at a frequency of 20 trains per hour. The late running Western and Northern via Strathfield lines trains are the continuation of services that arrived at Central station from the North Shore line.

The punctuality of East Hills line trains during the afternoon peak was relatively poor during the period. We looked at the 14 peak services (six in the morning peak and eight in the afternoon peak) that operate via Sydenham and Revesby. The eight afternoon peak services had an average punctuality of 85.8 per cent. These services are, together with one Southern Highlands' service that had punctuality of 50.3 per cent, the only services using the extra tracks constructed between Kingsgrove and Revesby in 2013. This major infrastructure project was designed to allow more express trains to operate between the Campbelltown area and the city while maintaining punctuality.

### Intercity trains perform relatively poorly during the inter-peak and afternoon peak

For close to four years starting mid-2011, the punctuality of intercity trains kept deteriorating relative to the punctuality of suburban trains. Exhibit 4 presents monthly punctuality data for suburban trains and intercity trains from July 2009 to July 2016.

**Exhibit 4: Train punctuality for suburban and intercity services; July 2009 to July 2016**



Source: Audit Office analysis of data from Sydney Trains website.

The punctuality of suburban trains declines during the morning peak and then recovers before the afternoon peak starts. The punctuality of intercity trains does not recover between the peaks in the same way.

Punctuality in the period from 10 am to 3 pm (between the morning and afternoon peaks) was 88 per cent for intercity trains compared with 96 per cent for suburban trains (see Appendix 4).



Apart from the impact on passengers travelling between the peaks, the failure of intercity services to recover means NSW Trains starts the afternoon peak with a number of trains already late thereby compromising the likelihood they can achieve the 92 per cent punctuality target.

## **2.3 Addressing poor punctuality**

### **Some, but not all, punctuality problem areas being addressed**

The rail agencies showed they had a reasonable understanding of the causes of the Western line and Northern via Strathfield line delays and were implementing strategies to address these up to 2019. These will be discussed later in this report.

Transport for NSW advises that recent modelling suggests the relatively poor performance of the express East Hills line trains in the afternoon was related to the train timetable and signalling which restricts how close trains can run behind each other into Campbelltown. It further advises that this will be corrected over the next three years.

The rail agencies were not able to provide evidence-based explanations for the inability of intercity train punctuality to recover between the morning and afternoon peaks and the relative deterioration in intercity punctuality between mid-2011 and mid-2015.

A key factor in the relatively poor performance of NSW Trains' intercity service may be the old age of its trains and of the tracks and signals outside the metropolitan area. Transport for NSW acknowledged that recent investment in the NSW Trains intercity fleet and track and signal infrastructure had been relatively lower than investment in suburban trains and the suburban network. Transport for NSW also advised that the recently announced New Intercity Fleet will address some of this relative under-investment.

### **NSW Trains' ability to improve intercity train punctuality is constrained**

Intercity trains are operated by NSW Trains. NSW Trains manages train crew on intercity services and station staff at intercity stations.

NSW Trains' analysis for the period from 1 July 2015 to 31 March 2016 attributed 72 per cent of their train lateness to other agencies and infrastructure and fleet failures.

Sydney Trains maintains the intercity fleet, maintains the track and signal infrastructure, responds to events that delay trains, and manages the movement of intercity trains from origin to destination. These functions can all impact on punctuality. Since 2013, there has been a contract for services between Sydney Trains and NSW Trains covering fleet maintenance, amongst other things. The contract includes a fleet reliability performance indicator but, at the time of the audit, the two parties had not yet agreed how this would be measured.

There is also no agreement or indicators to cover the priority to be given to NSW Trains by the Sydney Trains' Rail Management Centre when there is a delay or minor service interruption. NSW Trains advised that it is seeking to better define the priorities the Rail Management Centre gives NSW Trains' services compared to Sydney Trains' and freight rail services. Rail Management Centre management advised that the absence of an agreement or indicators does not affect the priority assigned to suburban and intercity trains. For extensive delays and major interruptions, there are agreed Alternate Customer Journey Plans to guide the Rail Management Centre's staff.

Transport for NSW advises that the three rail agencies are now working collaboratively to make improvements to the key indicators in the contracts.

### 3. Maintaining punctuality in the future

**The rail agencies are implementing strategies to maintain punctuality under pressure of increasing patronage until 2019. Transport for NSW is developing options to increase capacity and maintain punctuality after 2019. A costed plan is some way from being put to the government. Punctuality could come under pressure sooner if recent above-forecast patronage growth continues.**

Patronage increases are likely to present a significant challenge to maintaining punctuality into the future. The rail agencies have plans in place to address this challenge up to and including joining the Sydney Metro Northwest to the network at Chatswood in 2019. The various plans and strategies are being managed by experienced staff, with good governance arrangements, quality assurance processes and planning systems are in place.

The rail system in its current form will struggle to maintain punctuality beyond 2019 based on projections of patronage growth and system limitations. From 2024, the Sydney Metro City and Southwest will help by extending the metro network from Chatswood under Sydney Harbour, through the city and out to Bankstown. Recently established initiatives to better integrate land use and transport planning, and effective use of behavioural insights to modify passenger travel patterns, could also assist.

A significant increase in capacity of the existing heavy rail network is also needed to limit overcrowding and maintain targeted levels of punctuality. Transport for NSW is working on strategies to increase capacity but has not yet put a costed plan to the Government. Its aim is to do so by the third quarter of this (2017) calendar year.

Given the likely lead times for major infrastructure investment, there is a risk of poor punctuality after 2019 based on current patronage growth forecasts. If patronage continues to increase at a faster rate than forecast, particularly during the morning peak period, the network will face difficulties sooner. The rail agencies advise they are working to better understand passenger growth levels, trends and drivers.

#### **Recommendations**

Sydney Trains and Transport for NSW should:

- maintain effective oversight and resourcing for all strategies designed to address rail patronage growth
- adjust strategies for any patronage growth above projection.

Transport for NSW should:

- ensure that programs to address rail patronage growth over the next five to ten years are provided to the Government for Cabinet consideration as soon as possible
- explore the potential to use behavioural insights to encourage more passengers to travel outside the height of the morning peak (8 am to 9 am).

Sydney Trains, NSW Trains and Transport for NSW should improve the accuracy of patronage measurement and develop a better understanding of patronage growth trends.

### 3.1 Impact of patronage growth to date

#### Patronage increases are creating challenges

Despite the overall good train punctuality performance noted in the previous chapter, it is becoming harder for rail agencies to maintain a high level of punctuality. Options for managing patronage growth are declining. It is not possible to run more trains on parts of the network due to signalling system limitations. Punctuality cannot be maintained consistently when trains are operating at maximum frequency. Timetables are being used to move passengers to less crowded trains at a cost to their convenience.

Transport for NSW forecast that morning peak rail patronage would increase at an annual compound rate of growth of approximately 3.3 per cent from 2011 until 2026. This is much higher than past long term annual growth rates of around 1.2 per cent.

Between 2011 and 2016 the number of passengers travelling into the city grew by 4.3 per cent each year on average, including an annual growth rate of 6.6 per cent since May 2014.

By August 2016, nearly 14,500 more rail passengers were travelling into the city in the morning peak period than forecast in 2011 (including an additional 6,800 in the busiest one hour). See Exhibit 5.

This is equivalent to almost six trains, each with a passenger load factor (that is, the ratio of passengers on a train to the number of seats on the train expressed as a percentage) of 130 per cent. The number of passengers travelling in the busiest one hour is forecast to further increase by about 3,500 to 4,000 per year, which is equivalent to three or four trains each with a passenger load factor of 130 per cent.

In effect, growth is two years ahead of forecast.

#### Exhibit 5: Passenger exits at Sydney CBD stations (including Redfern)

	Survey Date					
	May 2011		May 2014		August 2016	
	6 am to 10 am	8 am to 9 am	6 am to 10 am	8 am to 9 am	6 am to 10 am	8 am to 9 am
Actual Count	173,262	85,503	187,767	92,186	216,800	106,627
Forecast Count	--	--	189,328	93,431	202,348	99,857
Difference (Actual – Forecast)	--	--	(1,561)	(1,245)	14,452	6,770

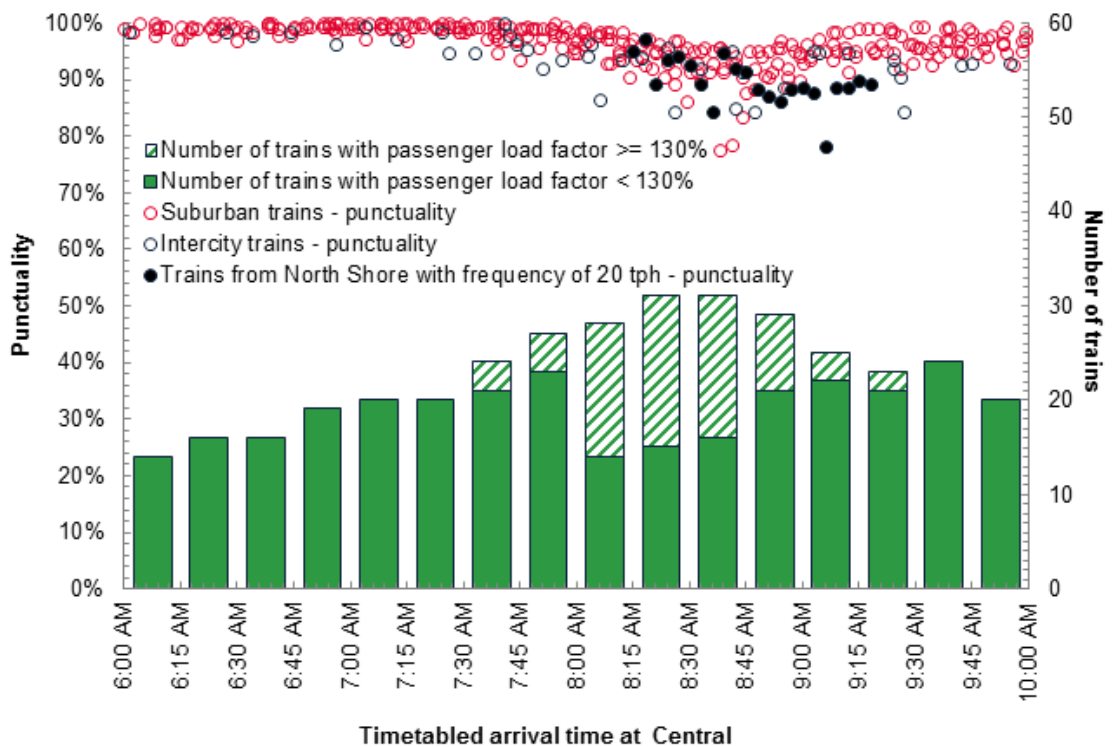
Source: Audit Office analysis of data from Transport for NSW.

#### Overcrowded trains are already compromising punctuality

At present, 119 trains arrive at Central station during the busiest hour in the morning. The March 2016 survey of train loads measured 52 of these as being overcrowded. In the half hour before and after the busiest hour another 12 trains were overcrowded.

When a train's passenger load factor exceeds approximately 130 per cent it can become difficult for the train to adhere to the timetable. The primary reason is that the time taken for passengers to alight from and board a crowded train can exceed the station dwell time allocated in the timetable. Exhibit 6 shows that punctuality decreases as the number of overcrowded trains increases.

**Exhibit 6: Train punctuality declines as the number of overcrowded trains increases**



Note: Each circle and dot represents the average punctuality of a train in the period from 1 July 2015 to 31 March 2016.  
 Source: Audit Office analysis of data from Sydney Trains and Transport for NSW.

**The capacity of the network to run more trains is declining**

Transport for NSW is using the timetable to move some passengers from more crowded to less crowded trains by changing the stations at which trains stop. This increases journey times for some people and is symptomatic of the diminishing scope to add train services during peak periods in some parts of the network.

**Exhibit 7: Using the timetable to move passengers to less crowded trains**

The express services from Cronulla and Waterfall to the city were overcrowded before the 2013 timetable. This timetable removed the stops at Kogarah and Rockdale from express services during the peak periods. Passengers from these stations had no option but to board the slower, but less crowded, all-stations services. Additionally, some passengers from south of Hurstville to Kogarah and Rockdale had to change trains mid-journey to reach their destination. This is an indicator that the Illawarra line is close to or has exceeded its capacity to run more trains.

Source: Audit Office analysis.

The practice of terminating suburban trains at Central station’s country platforms and requiring passengers to transfer to other trains is also an indicator that parts of the network cannot carry more trains. Two suburban services currently terminate at Central station’s country platforms, and more are likely to terminate here in future timetables.

## Exhibit 8: Terminating suburban trains at Central's country platforms

Services to the city from the Western and Northern via Strathfield lines typically continue through the city and north over the Sydney Harbour Bridge. Given the constraints of the current network, the maximum number of trains that can operate over a section of track is 20 per hour. In the busiest hour of the morning (8 am to 9 am), 22 trains run from the Western and Northern via Strathfield lines to the city. Twenty continue north over the Bridge and two terminate at Central station's country platforms. Terminating suburban services at Central station forces passengers to change trains mid-journey, but it is an option when it is not possible to run more trains per hour through the city.

Source: Audit Office analysis.

Passengers generally dislike changing trains. This is shown by the difference in patronage between the two Epping services terminating at Central station's country platforms and the two services commencing at Epping six minutes earlier but continuing through the city. Passengers appear to prefer a six minute slower journey to changing trains mid-journey.

## Exhibit 9: Passenger loads on Epping to City via Strathfield, March 2016 load survey

Epping Departure	Central Arrival	Journey Time	Interchange?	Passengers
7.47 am	8.24 am	37 min	No	1,531
7.53 am	8.24 am	31 min	Yes	309
8.02 am	8.39 am	37 min	No	1,565
8.08 am	8.39 am	31 min	Yes	315

Source: Audit Office analysis of data from Transport for NSW.

The number of unused train paths is also declining. Under the current network configuration, only seven train paths (six per cent) are spare between 8 am and 9 am. Future timetables will likely utilise these train paths by 2019.

Once this occurs, there will be virtually no scope to run additional trains through the city to cope with any higher than forecast demand. This risks an increase in the number of trains with a passenger load factor in excess of 130 per cent, and therefore to punctuality.

### Punctuality cannot be maintained when intervals between trains are short

The more frequent trains run, the shorter the gap between trains, the more likely an incident could impact on punctuality. This is because the time available to recover from an incident is reduced and hence the likelihood of a knock-on effect on following trains is increased.

Due to limitations of the current signalling system, a maximum of 20 trains per hour can be timetabled at present. Even so, this level of punctuality is proving hard to maintain at this frequency.

Exhibits 10 and 11 show that as the number of trains in a 15-minute period increases, punctuality decreases and vice-versa.

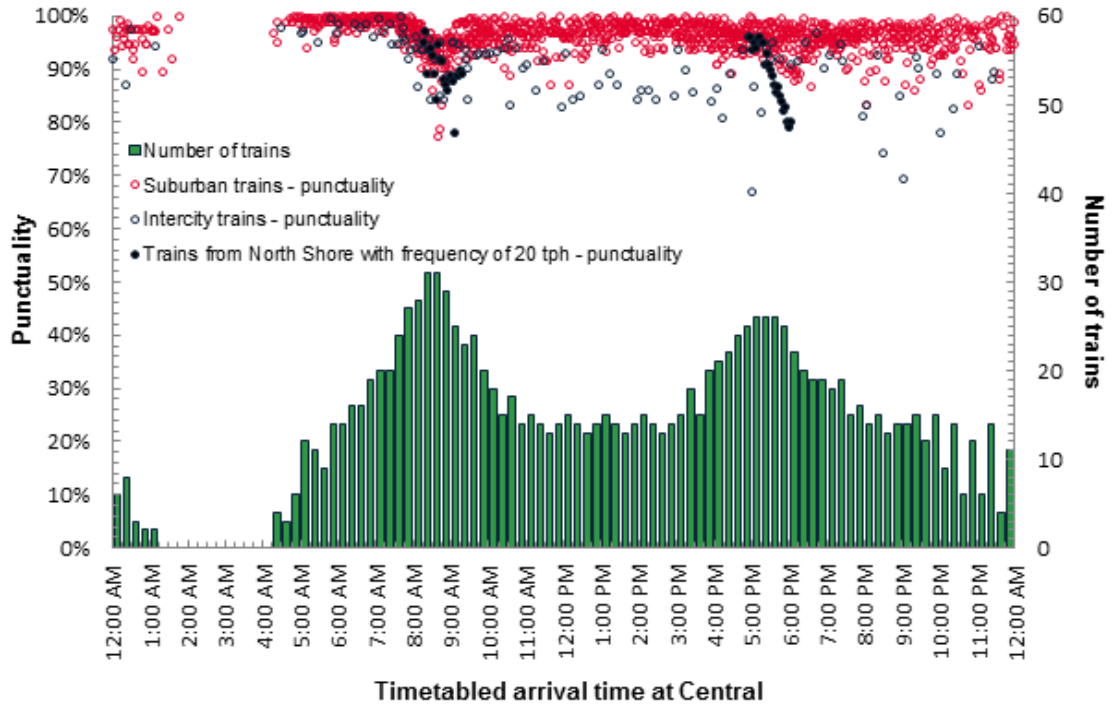
These exhibits each show two sequences of black dots.

In Exhibit 10, the sequence in the morning peak (6 am to 10 am) represents the punctuality of 22 consecutive trains operating from the North Shore to Central at a rate of 20 trains per hour. The sequence in the afternoon peak (3 pm to 7 pm) represents the punctuality of 24 consecutive trains at a rate of 20 trains per hour. In Exhibit 11, the black dots represent the punctuality of the same trains on their journey away from Central station to their destinations on the Western and Northern via Strathfield lines.

Exhibit 10 shows that punctuality dropped 16 percentage points during the afternoon sequence of 24 trains. The deterioration is noticeable after approximately the first ten trains. Exhibit 11 shows even further deterioration in punctuality as these trains from the North Shore line reach their destinations on the Western and Northern via Strathfield lines.

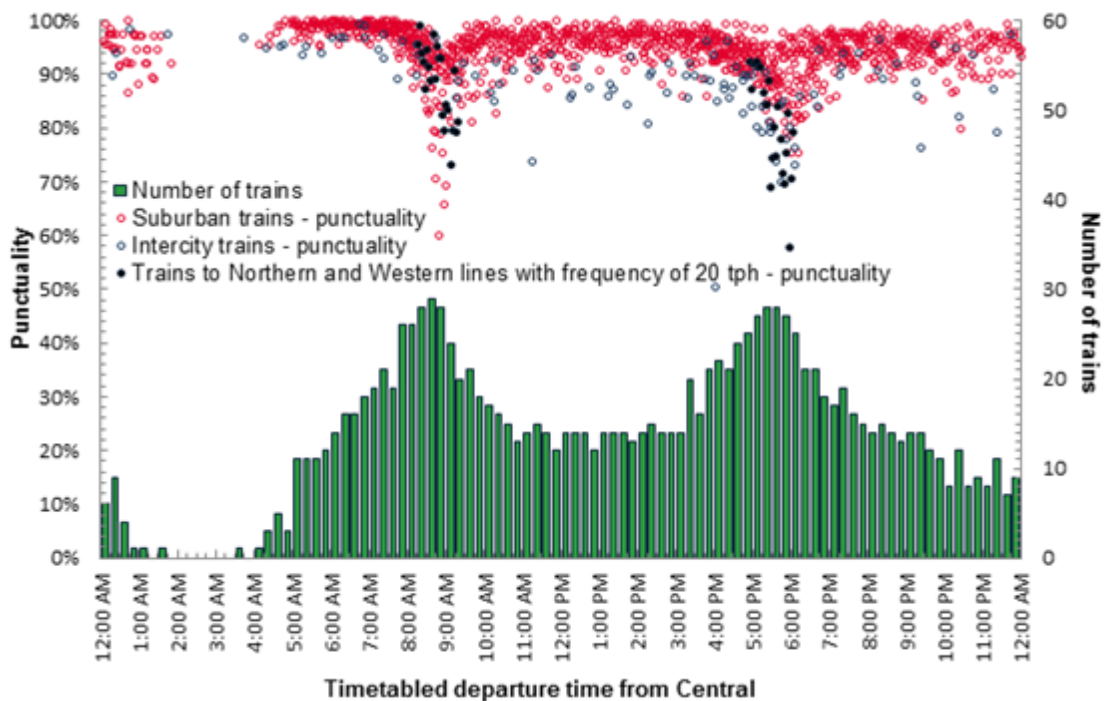
These two Exhibits also demonstrate the point made earlier that the punctuality of suburban trains recovers between the morning and afternoon peaks (red dots), but the punctuality of intercity trains does not recover in the same way (grey dots).

**Exhibit 10: Punctuality and number of trains arriving at Central on weekdays for 1 July 2015 to 31 March 2016**



Note: Each dot represents the average punctuality of a train in the period from 1 July 2015 to 31 March 2016.  
Source: Audit Office analysis of data from Sydney Trains.

**Exhibit 11: Punctuality and number of trains departing from Central on weekdays for 1 July 2015 to 31 March 2016**



Note: Each dot represents the average punctuality of a train in the period from 1 July 2015 to 31 March 2016.  
Source: Audit Office analysis of data from Sydney Trains.

## 3.2 Maintaining punctuality to 2019

### Rail agencies responding to the challenge

A range of factors influence punctuality including train breakdowns, security and trespass, track infrastructure failures and sick passengers. Projected patronage increases, which can lead to overcrowding and trains having to wait longer at stations, present a particularly significant challenge to maintaining punctuality into the future.

The rail agencies understand the challenge presented by patronage growth over the next few years. In response to the challenge a range of initiatives are being implemented.

#### Operational Capacity Program

Sydney Trains is undertaking an in-depth study of human factors with initial work focussed on the T1 Line (North Shore, Northern and Western lines). The purpose is to assess whether network capacity (as measured by trains per hour) can be increased without augmenting existing infrastructure. Some of the factors being examined include variability in train driver behaviours, appropriateness of placement of track-side signage, driver training and station staff management of train dwell times. The desired outcome is to make behaviours consistently best practice to make best use of existing network capacity.

#### The Rail Operations Centre

The new Rail Operations Centre at Green Square is due to open in 2018 at a cost of \$276 million. The Rail Operations Centre will introduce new technologies that will improve punctuality through better management of incidents that delay trains. A by-product is that customers will be better informed of how service disruptions are being managed so they will be able to make decisions about alternative travel plans that better meet their needs.

The Rail Operations Centre's Incident Management System is expected to deliver a superior ability to manage incidents that delay trains. This means that when an event occurs that delays trains, response and recovery times should be shorter.

The Rail Operations Centre will introduce a Day of Operations Timetable System. When an event occurs that disrupts the planned timetable the Day of Operations Timetable System will automatically develop an interim timetable for the disrupted services and the changes will be quickly communicated to train crew and station staff.

A Customer Information Management System is also planned so that when train services are disrupted precise and detailed information about timetable changes will be quickly communicated to staff and customers.

The Rail Operations Centre can be truly transformational if the Day of Operations Timetable System's re-planning, and therefore real-time operational decision-making, focuses on minimising customer delay. This would be a significant step toward embedding the customer-centric service delivery culture to which the executive of all the rail agencies is committed. Whilst the project is still underway, staff are examining how best to make decision making during disruptions more customer-centric.

#### Upcoming timetables

New timetables are being developed to allow a smooth transition up to the 2019 completion of the Sydney Metro Northwest to Chatswood. These timetables should:

- add additional services in the busiest one hour, increasing the number of passengers that can be accommodated
- provide more services and cater for more passengers at times outside the peaks.

Also, the timetables are likely to use demand management to obtain more efficient use of available network capacity. For example, changed stopping patterns are likely to 'move' some passengers from overcrowded trains to slower but less crowded trains. Passengers generally do not like slower journey times.

There are some risks as well. The timetables are likely to result in extended periods of trains operating at 20 per hour. Earlier we demonstrated that punctuality is hard to maintain at this frequency with current infrastructure.

### **Enabling projects for upcoming timetables**

The rail agencies recognise that a higher level of operational efficiency and effectiveness is needed to support the upcoming timetables. Some of the key projects designed to achieve this are:

- Hornsby Junction remodelling, to allow efficient handling of the increase in train movements
- North Shore line resignalling, to increase the service reliability at 20 trains per hour
- power supply upgrades, to cope with more frequent services
- station upgrades, to alleviate platform crowding
- Sydney and Strathfield Signal Box Automation, to allow additional train movements
- Parramatta Turnback, to allow some services to start/finish trips at Parramatta.

### **Initiatives should allow punctuality targets to be met**

The precise impact of the various initiatives and activities on punctuality is unknown until the activities take effect. On the basis that patronage increases as forecast, the probability is reasonably high that train punctuality can be maintained at the 92 per cent target up to and including joining the Sydney Metro Northwest to the network in 2019.

The various initiatives under the Operational Capacity Program and the timetable enabling projects together with the commencement of the Rail Operations Centre all have the capability of improving punctuality. The initiatives and projects are being managed by experienced and knowledgeable officers, and appropriate governance and assurance frameworks are in place. For example:

- Sydney Trains has established a project coordination office, transferred its director of operations to head it, and seconded other senior and experienced staff to run each project under him
- Infrastructure NSW has conducted a gateway review of the activities associated with future timetables
- Sydney Trains is using Primavera (an industry-standard project management tool) to monitor progress and project interactions in preparation for the integration of Sydney Metro Northwest.

In 2015–16, punctuality was at 94.2 per cent, above target by 2.2 percentage points. This provides some leeway before performance falls below the 92 per cent target.

### **Improving data should help communication with customers**

A significant change in recent years has been customer access to information via smart phones, and the availability of smartphone applications (apps). These apps are provided by private developers, but are based on information on planned and real-time train movements provided to these developers by Sydney Trains.

The Rail Operations Centre's improvements to data quality and timeliness should flow through to the quality and timeliness of information available to customers through apps. In addition, some of the more modern trains operating on the suburban network capture information that can be used to estimate the number of passengers on board. Presently, this information is stored on the train and can only be downloaded manually. Sydney Trains is looking at ways in which this passenger load data can be captured centrally so it can be provided to app developers.

Knowing actual passenger loads should help passengers plan their trips and, in some cases, avoid overcrowded trains. It is possible that distributing this information could result in a more uniform distribution of passenger loads on trains.



### Getting more passengers travelling outside busiest time would help

The rapidly diminishing number of train paths through and into the city during the 8 am to 9 am period was discussed earlier. However, there remains spare train paths and space for passengers in the remainder of the peak period (see Exhibit 12). Utilisation of this spare capacity requires encouraging passengers to change travel patterns and travel outside the 8 am to 9 am period.

Achieving this change in travel patterns is not straightforward because, despite the crowding on trains in this period, about 45 to 50 per cent of peak period train passengers arrive in the city between 8 am and 9 am. In the past, the rail agencies have trialled initiatives to encourage changes in travel patterns with limited success. Nevertheless, it could be worthwhile to again look at this issue, particularly given the increasing flexibility in work practices available to many city workers.

#### Exhibit 12: Passenger loads on trains entering the Sydney central business district in March 2016

Arrival at Central	Average load factor (%)
6 am – 7 am	49
7 am – 8 am	90
8 am – 9 am	123
9 am – 10 am	72

Source: Audit Office analysis of data from Transport for NSW.

The relatively new field of behavioural insights may offer opportunities to ‘nudge’ some passengers into different travel patterns with benefits for them and the network.

#### Exhibit 13: Behavioural insights

Behavioural insights help policy makers understand human behaviour and decision making. They can use this understanding of how humans actually behave in everyday life to help people make better decisions for themselves and society.

The application of behavioural insights in the UK and Australia has demonstrated that low-cost, subtle changes to communications and delivery mechanisms can substantially improve policy interventions and offer an alternative to more expensive options. It provides policy makers with an important new set of methods to add to their toolkit.

Source: Australian and New Zealand School of Government, 2016.

### 3.3 Maintaining punctuality beyond 2019

#### Significant increase in capacity to run more trains is needed beyond 2019

Patronage growth forecast beyond 2019 cannot be accommodated for long without either a decline in punctuality or a significant increase in the capacity of the existing heavy rail network to run more trains per hour in peak periods. Unless something more is done than described in the previous section, the average number of passengers per train will increase passenger load factors beyond 130 per cent on more trains. The more trains are overcrowded, the greater the effect on punctuality.

There will be little scope to manage passenger growth beyond 2019 through the timetable. It is likely that, by then, the timetable will have exhausted most options for dealing with increased patronage within the limitations of network infrastructure.

There will be some relief in 2024 with the completion of the Sydney Metro City and Southwest. This will reduce the loads on trains from the North Shore. Most passengers on Sydney Metro Northwest will no longer need to interchange at Chatswood and train paths previously utilised

by trains from the Bankstown line will become available to the Airport, Inner West and South lines.

### Options for a substantial increase in network capacity are being developed

Transport for NSW has recognised the need to substantially increase the capacity of the heavy rail network in the period from 2019 to 2024 to prevent a decline in punctuality. It has established a Rail Services Delivery Office and undertaken substantial work on strategies to address the predicted patronage growth in collaboration with Sydney Trains and NSW Trains.

One option to increase the number of trains that can fit on existing tracks is the Advanced Train Control System. Such a system allows trains to run closer together safely. Technologies similar to the Advanced Train Control System with modern on-board signalling have been implemented successfully elsewhere achieving increases of up to 40 per cent in the maximum number of trains that can run per hour. Transport for NSW recently decided it would replace the current trackside signalling system with the Advanced Train Control System across the network over time. Technical support for the old trackside system is being discontinued, spare parts will become unavailable in time, and the whole-of-life cost of the Advanced Train Control System will be much lower. The timing of the change has not been determined although it is likely to commence no sooner than 2020–21.

There will be other implications arising from increasing train frequency, including:

- more train carriages and engines will be needed
- incident recovery times will need to be faster (although the Rail Operations Centre should help)
- track and fleet reliability will need to improve, so maintenance plans will need to be reviewed
- station capacities will need to increase to cope with more passenger throughput, particularly in the Sydney central business district.

### A costed plan has yet to be put to government

While options to address patronage growth beyond 2019 have been developed, Transport for NSW is yet to put a costed plan to the government. Its aim is to put a costed plan to the government by the third quarter of this calendar year (2017). The likely scale of investment needed would require Cabinet approval.

Any significant infrastructure project on the rail network requires a substantial lead time, so the absence of an agreed and funded plan creates a high risk of overcrowding and a decline in punctuality between 2019 and 2024.

Unless the capacity of the heavy rail network increases substantially and broadly in line with patronage increases, punctuality is likely to decline and customer satisfaction is likely to fall. This would be unfortunate given that the strong customer focus within the transport portfolio in recent years has resulted in customer satisfaction rates of around 90 per cent. Research shows that customer satisfaction is highly dependent on punctuality and consistency in performance.

### Patronage growth above forecast would mean punctuality problems arise sooner

The assessment that major punctuality issues may start to occur soon after 2019 is based on the forecast levels of patronage growth. If patronage growth is more than forecast, the rail agencies may find it difficult to meet the 92 per cent target before then.

Recently, patronage growth has been well above forecast. Between May 2011 and May 2016, the number of people exiting the rail network at city stations in the morning peak grew by 23.3 per cent compared to a forecast increase of approximately 15.9 per cent. Almost two-thirds of this growth occurred in the past two years.

Train loads surveys show that between March 2015 and March 2016 patronage grew by 6.5 per cent in the busiest hour compared with a forecast average annual growth of 3.3 per cent.

If the current forecast is accurate there will be 14,000 extra patrons in the busiest hour by 2019, roughly equivalent to the expected increase in the number of passengers that can be accommodated. If the recent patronage trend continues, the extra patronage will be 20,000 by 2019, well above the number of passengers that could be accommodated.

Perhaps more critical for punctuality is the number and proportion of services with a passenger load exceeding 130 per cent during the busiest hour. The March 2016 train load survey observed 44 per cent of services during this hour exceeded 130 per cent. We estimate that by 2019:

- 49 per cent will exceed 130 per cent based on forecast patronage growth
- 56 per cent will exceed 130 per cent if recent patronage growth is maintained.

Rail agencies need to have a better understanding of current patronage growth and drivers, particularly during peak periods. We identified some missing information in train load survey data which raised doubts about its accuracy and usefulness for such purposes. We also noted that part of the growth in the last year may be induced by the Opal card fare policy, which has been changed recently. Transport for NSW advises that it recently discontinued train load surveys and is implementing improvements to its data collection and analysis methods.

### **Opportunity to better integrate transport and land use planning to manage demand**

Transport for NSW and the Greater Sydney Commission are working collaboratively to better link transport and land use planning, with an aim being for population growth to occur where it can be best accommodated by the transport system.

In January 2017, a joint project team was established in Parramatta for this purpose. The project director reports to both Transport for NSW and the Greater Sydney Commission.

The key deliverable will be a Future Transport Strategy to meet the demands of predicted population growth in NSW. It will be a 40 year strategy focusing on the technological, economic and social changes ahead and is due to be released in late 2017.

# Appendices

---

## Appendix 1: Response from the agencies



Our Ref: SO17/02807  
Your Ref: PA6581

Ms Margaret Crawford  
Auditor-General of NSW  
Audit Office of New South Wales  
GPO Box 12  
SYDNEY NSW 2001

Dear Ms Crawford

### Performance Audit Report – Passenger Rail Punctuality

Thank you for the opportunity to respond to the final report on the performance audit of Passenger Rail Punctuality, which was provided to Transport for NSW on 7 March 2017.

Firstly, the Transport Cluster acknowledges the report's conclusion that rail agencies are well placed to manage the forecast increase in passengers for the short to medium term. This is a positive finding and reflects the significant hard work that Transport for NSW and Sydney and NSW Trains have put in over the past few years to greatly improve customer services on the train networks.

However, the report then implies that the Transport Cluster does not have specific approaches to deal with customer growth beyond that short to medium term period.

This finding is not supported by the facts.

Transport for NSW is currently either delivering or planning rail network upgrades in Sydney at an unprecedented level to both address current growth and longer term future demand.

This work commenced with the release of the *Long Term Transport Masterplan* and *Sydney's Rail Future* some 4 to 5 years ago. These documents set out the future needs and investments required to provide for a significant increase in customer numbers to 2030.

Most importantly, the NSW Government has then allocated significant amounts of funding annually so that these plans and policies can be effectively implemented. Transport for NSW and the train operators are now well on the way to providing for customer growth over the short, medium and long term.

This includes investments which have and will continue to provide for a range of new train services over the next 10+ years such as:

- The procurement of suburban and intercity trains for the Sydney and NSW Trains networks
- Sydney Metro services for both the North West and City & South West of Sydney
- Additional capacity on the Sydney Trains network unlocked by the design of the Metro
- New enabling track works to introduce the next short term timetable changes
- Further timetable planning into the 2020's including further simplifying the network
- New technologies and power supply upgrades across the Sydney Trains network
- A new Rail Operations Centre to provide a more modern approach to network control
- Further separation of freight and passenger train lines to provide more reliability
- Customer information and wayfinding which are providing continuous improvements

---

#### Transport for NSW

18 Lee Street, Chippendale NSW 2008 | PO Box K659, Haymarket NSW 1240  
T 02 8202 2200 | F 02 8202 2209 | W [transport.nsw.gov.au](http://transport.nsw.gov.au) | ABN 18 804 239 602

- An Opal fares and ticketing system which provides even greater levels of integration
- A day in day out customer focus by the people of Sydney and NSW Trains

These initiatives are driving results. They have increased customer satisfaction significantly and punctuality has improved across much of the network. In this regard, we welcome the Audit Office's recognition that the cluster's use of a customer delay metric is leading practice and a positive development towards the priority of 'putting the customer at the centre of everything we do', and note the recommendations in the report.

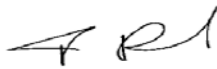
However, there is always more to do and we acknowledge the need for an ongoing need to plan for how to effectively manage the growth of the network and to maximise the efficient use of that network.

The growth rates we are now experiencing are significant even at an international level. In response we have significant amounts of medium term work underway. In addition, Transport for NSW has a ten year asset management plan (updated and agreed annually) which outlines the plans and priorities required to address growth of the train network across Sydney.

In addition, over the longer term, Transport for NSW has commenced the process of refreshing the Long Term Transport Masterplan. This involves working closely with the Greater Sydney Commission and Infrastructure NSW so that our plans are not undertaken in isolation. Rather, they are truly joined up with land use planning so Sydneysiders can understand how areas of Sydney will grow and how they will be served by a growing transport network, particularly the Sydney Trains network and Sydney Metro.

Within the above context I would request that the Audit Office reconsiders the conclusions made in terms of a lack of planning and/or investment to deal with train customer growth beyond the short to medium term. We do not agree with that conclusion and this letter simply outlines some of the significant investments underway to address customer growth. Those investments by their very nature will all be in place to respond to growth in the short to medium term, and in many instances, the long term as well.

Yours sincerely



**Tim Reardon**  
Secretary, TfNSW

4 April 2017



**Howard Collins, OBE**  
Chief Executive Sydney Trains  
Acting Chief Executive NSW TrainLink

## Appendix 2: Response from Audit Office

The report acknowledges that transport agencies have plans and projects in development or being implemented to manage patronage growth up to and beyond 2019. This report takes into account the:

- Long Term Transport Master Plan (p2 and p5)
- planned procurement of new trains (p3 and p15)
- Sydney Metro North West which is expected to be completed by 2019 (p3, p21 and p22)
- Sydney Metro City and South West which is expected to be completed by 2024 (p3 and p23)
- enabling projects for upcoming timetables including track works, power supply upgrades, and other new technologies (p3 and p22)
- Rail Operations Centre (p3 and p21)
- planned new Customer Information Management System (p21), the potential of the Rail Operations centre to improve customer information particularly through telephone apps (p22)
- customer-centric service delivery culture now evident in the transport agencies (p21).

Our analysis of the facts led us to conclude that despite these plans, strategies and projects there remains a significant risk to punctuality after 2019 (p3 and p23). This is because:

- overcrowding is already compromising punctuality (p17)
- of the unprecedented levels of recent and projected patronage growth (pp3-5, p17 and pp21-25)
- infrastructure constraints, particularly signalling, limit the number of additional trains that can be run in peak periods on the existing heavy rail network (p19).

Our report acknowledges that Transport for NSW:

- in collaboration with Sydney Trains and NSW Trains, has undertaken work in developing additional strategies to increase the capacity of the heavy rail network to prevent a decline in punctuality, including an Advanced Train Control System to replace the current trackside signalling system (p3, p4 and p24)
- expects to put a plan for this purpose to the government by the third quarter of this (2017) calendar year. The likely scale of investment needed would require Cabinet approval (p4 and p24).

The absence of such an agreed and funded plan creates a high risk of overcrowding and a decline in punctuality beyond 2019, particularly as major infrastructure projects have long leads times (p4, p16 and p24).

## Appendix 3: About the audit

### Audit objective

This audit assessed whether rail agencies have plans and strategies to maintain or improve performance in getting the growing number of rail passengers to their destinations on time.

### Audit criteria

We addressed the audit objective by assessing performance against the following criteria:

- Rail agencies have reliable information on performance in getting rail passengers to their destinations on time, and are taking or planning remedial action to address any performance shortcomings
- Rail agencies have developed plans and strategies to get the predicted increased number of rail passengers to their destinations on time in future
- Rail agencies have plans to improve communication to assist passengers get to their destinations on time.

### Audit scope and focus

The audit focussed on suburban services operated by Sydney Trains and intercity services operated by NSW Trains. It looked at punctuality from the perspectives of both train operations and customers.

### Audit exclusions

The audit did not:

- examine coaches and buses operated by Sydney Trains and NSW Trains including replacement buses used during service disruptions
- assess in depth the adequacy of planned improvements or the validity of forecasts of future passenger demand
- challenge the appropriateness of punctuality performance targets.

### Audit approach

Our procedures included:

- interviews with relevant staff in TfNSW, Sydney Trains, and NSW Trains
- examination of relevant documents, including legislation, policies, strategies, guidelines, procedures, reports, reviews
- statistical analysis of recent train punctuality data
- consultations with representatives of key stakeholders
- research into better practices.

Expert advice was provided by Ian Kearns.

The audit approach was complemented by quality assurance processes within the Audit Office to ensure compliance with professional standards.

### Audit methodology

Our performance audit methodology is designed to satisfy Australian Audit Standards ASAE 3500 on performance auditing. The Standard requires the audit team to comply with relevant ethical requirements and plan and perform the audit to obtain reasonable assurance and draw a conclusion on the audit objective. Our processes have also been designed to comply with the auditing requirements specified in the *Public Finance and Audit Act 1983*.

## **Acknowledgements**

We gratefully acknowledge the co-operation and assistance provided by Transport for NSW, Sydney Trains and NSW Trains. In particular, we wish to thank the liaison officers and staff who participated in interviews and provided material relevant to the audit.

## **Audit team**

Rod Longford and Ian Kearns conducted the performance audit, assisted by Michelle Ravindran, Huntley Evans and Francois Chee. Giulia Vitetta was the Engagement Reviewer.

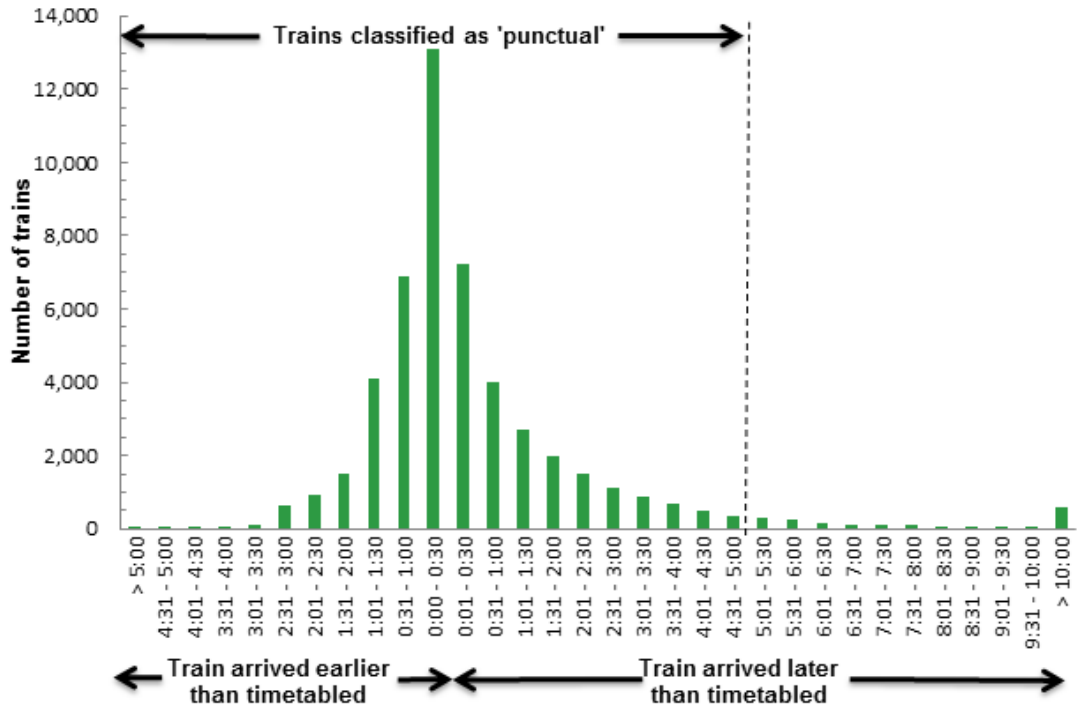
## **Audit cost**

Including staff costs, travel and overheads, the estimated cost of the audit was \$375,000.



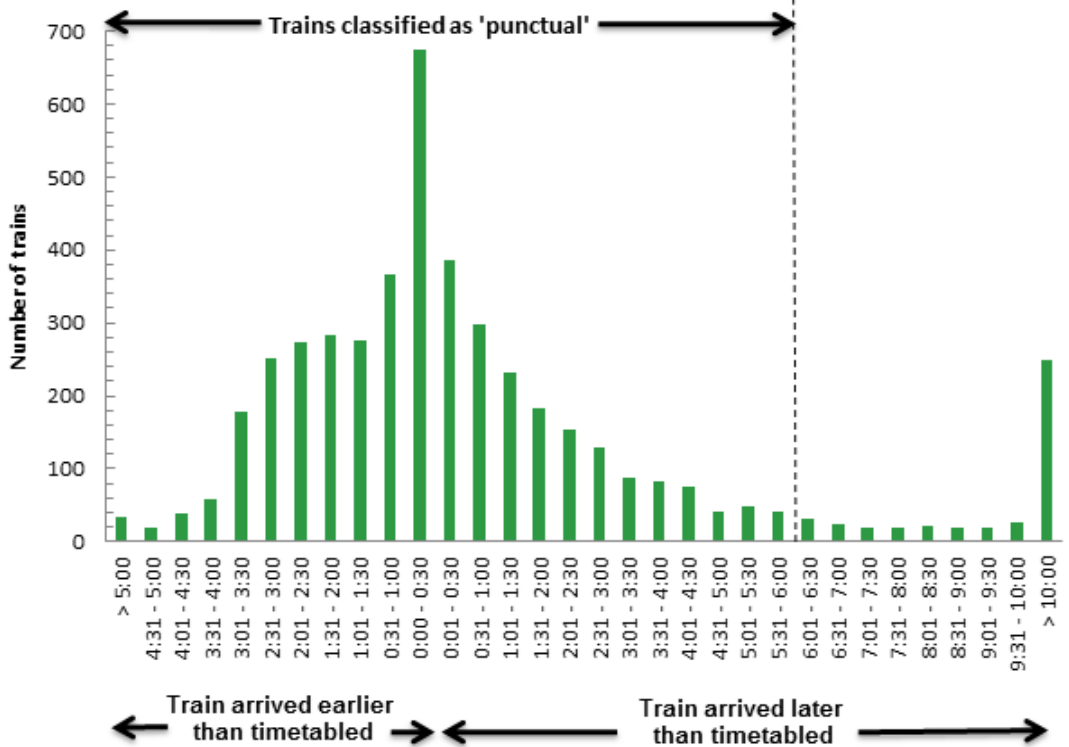
## Appendix 4: Accuracy of punctuality measurement

**Exhibit A3.1: Difference between actual and timetabled arrival for Sydney Trains services from 1 to 31 March 2016, 24 hour period**



Source: Audit Office analysis of data from Sydney Trains.

**Exhibit A3.2: Difference between actual and timetabled arrival for NSW Trains services from 1 to 31 March 2016, 24 hour period**



Source: Audit Office analysis of data from Sydney Trains.

## Appendix 5: Train and customer punctuality

### Exhibit A4.1: Punctuality of trains arriving at Central from 1 July 2015 to 31 March 2016

Operator / Line		Weekdays					Weekends		
		Time Period					Day of Week		
		AM Peak (%)	Inter-peak (%)	PM Peak (%)	Other Times (%)	Weekday Overall (%)	Saturday (%)	Sunday (%)	Weekend Overall (%)
<b>Sydney Trains: suburban</b>									
T1	North Shore	95.1	98.0	93.2	97.4	95.8	97.6	98.0	97.8
	Northern via Macquarie Park	97.2	97.0	93.2	97.5	96.0	98.1	98.4	98.3
	Northern via Strathfield	97.5	97.8	96.3	95.4	96.7	96.9	98.3	97.6
	Western	96.0	95.7	94.8	92.2	94.8	93.7	94.1	93.9
	T1 Overall	96.2	97.1	94.1	95.4	95.6	96.4	96.9	96.6
T2	Airport	96.3	96.7	97.7	96.5	96.8	94.9	94.7	94.8
	East Hills	95.5	--	--	--	95.4	91.4	95.1	93.2
	Airport & East Hills	96.2	96.7	97.7	96.5	96.7	94.8	94.8	94.8
	Inner West	96.8	97.9	97.5	97.4	97.4	95.3	97.0	96.2
	South	93.8	97.0	95.6	93.8	94.9	94.2	95.0	94.6
	T2 Overall	95.8	97.1	97.2	96.3	96.6	94.8	95.6	95.2
T3	Bankstown	97.5	97.9	98.0	96.7	97.5	98.3	99.1	98.7
T4	Eastern Suburbs	96.5	98.1	94.7	97.9	96.6	98.0	98.8	98.4
	Illawarra	97.2	94.4	95.3	95.5	95.7	95.9	96.9	96.4
	T4 Overall	96.8	96.4	95.0	96.8	96.2	97.0	97.9	97.5
T5	Cumberland	Services operate between Campbelltown and Schofields and do not pass Central							
T6	Carlingford <sup>a</sup>	Services operate as a shuttle between Carlingford and Clyde and do not pass Central							
T7	Olympic Park <sup>b</sup>	--	96.3	91.4	90.8	91.9	92.8	97.7	94.8
<b>Suburban Overall</b>		<b>96.4</b>	<b>97.0</b>	<b>95.4</b>	<b>96.1</b>	<b>96.2</b>	<b>96.1</b>	<b>97.0</b>	<b>96.6</b>
<b>NSW Trains: intercity</b>									
Inter-city	Blue Mountains	93.0	88.8	89.1	91.8	91.1	90.3	92.6	91.5
	Central Coast & Newcastle	90.9	87.2	85.1	89.8	89.0	89.2	92.9	91.1
	South Coast	96.2	92.1	91.2	87.7	92.2	87.0	91.6	89.3
	Southern Highlands	--	83.4	--	--	83.4	86.7	92.0	89.3
<b>Intercity Overall</b>		<b>92.9</b>	<b>88.7</b>	<b>88.1</b>	<b>89.8</b>	<b>90.4</b>	<b>88.9</b>	<b>92.4</b>	<b>90.7</b>
<b>Total</b>		<b>96.0</b>	<b>96.3</b>	<b>94.9</b>	<b>95.6</b>	<b>95.7</b>	<b>95.5</b>	<b>96.6</b>	<b>96.1</b>

a One direct service from Carlingford to Central in the AM Peak had punctuality of 94.7 per cent but is categorised by Sydney Trains as Western line

b Olympic Park line usually operates as a shuttle between Olympic Park and Lidcombe but during major events some services operate between Olympic Park and Central

Note: The percentages to which the 92 per cent contract targets apply are shaded.

Source: Audit Office analysis of data from Sydney Trains.

**Exhibit A4.2: Punctuality of trains departing from Central from 1 July 2015 to 31 March 2016**

Operator / Line		Weekdays					Weekends		
		Time Period					Day of Week		
		AM Peak (%)	Inter-peak (%)	PM Peak (%)	Other Times (%)	Weekday Overall (%)	Saturday (%)	Sunday (%)	Weekend Overall (%)
<b>Sydney Trains: suburban</b>									
T1	North Shore	93.0	97.5	92.9	96.3	94.8	96.8	97.1	96.9
	Northern via Macquarie Park	92.5	96.5	95.3	96.2	95.0	98.0	98.0	98.0
	Northern via Strathfield	95.4	95.7	89.0	95.3	94.1	95.5	96.2	95.8
	Western	92.7	94.1	87.6	92.4	91.2	93.3	94.3	93.8
	T1 Overall	93.1	95.9	90.4	94.8	93.5	95.6	96.2	95.9
T2	Airport	96.1	97.5	93.9	96.7	96.1	93.6	93.4	93.5
	East Hills	--	--	85.8	94.5	86.9	98.6	96.5	97.6
	Airport & East Hills	96.1	97.5	92.3	96.6	95.6	93.8	93.6	93.7
	Inner West	93.4	97.6	97.3	95.4	95.6	95.4	97.4	96.4
	South	97.2	95.2	90.1	94.6	94.0	94.6	94.3	94.4
	T2 Overall	95.3	97.0	92.7	95.8	95.2	94.5	95.0	94.7
T3	Bankstown	96.2	97.1	94.2	96.4	96.0	97.7	98.8	98.2
T4	Eastern Suburbs	95.7	95.0	94.9	96.4	95.5	95.5	96.9	96.2
	Illawarra	94.4	93.6	90.0	93.7	92.9	94.2	96.3	95.2
	T4 Overall	95.1	94.2	92.6	95.1	94.2	94.9	96.6	95.8
T5	Cumberland	Services operate between Campbelltown and Schofields and do not pass Central							
T6	Carlingford	Services operate as a shuttle between Carlingford and Clyde and do not pass Central							
T7	Olympic Park <sup>a</sup>	87.5	98.1	94.4	98.4	95.5	97.8	97.3	97.6
<b>Suburban Overall</b>		<b>94.5</b>	<b>95.9</b>	<b>92.0</b>	<b>95.3</b>	<b>94.4</b>	<b>95.4</b>	<b>96.2</b>	<b>95.8</b>
<b>NSW Trains: intercity</b>									
Inter-city	Blue Mountains	94.1	90.9	86.5	91.7	90.1	89.5	90.4	89.9
	Central Coast & Newcastle	92.4	85.5	85.4	93.5	88.7	85.3	90.6	87.9
	South Coast	96.1	89.1	84.4	87.0	88.3	85.5	92.1	88.8
	Southern Highlands	--	--	50.3	--	50.3	76.4	78.1	77.2
<b>Intercity Overall</b>		<b>93.9</b>	<b>88.1</b>	<b>84.7</b>	<b>91.4</b>	<b>88.7</b>	<b>86.1</b>	<b>90.6</b>	<b>88.4</b>
<b>Total</b>		<b>94.5</b>	<b>95.3</b>	<b>91.1</b>	<b>94.9</b>	<b>93.9</b>	<b>94.5</b>	<b>95.7</b>	<b>95.1</b>

<sup>a</sup> Olympic Park line usually operates as a shuttle between Olympic Park and Lidcombe but during major events some services operate between Olympic Park and Central

Note: The percentages to which the 92 per cent contract targets apply are shaded.

Source: Audit Office analysis of data from Sydney Trains.

**Exhibit A4.3: Customer Delay Measure outcomes from July 2015 to April 2016  
(weekdays only excluding public holidays)**

**Morning Peak travelling to Sydney CBD**

		2015						2016			
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
<b>Sydney Trains: suburban</b>											
T1	North Shore	2:19	2:47	2:33	2:17	4:02	2:26	2:21	3:43	4:30	3:25
	Northern via Macquarie Park	1:49	3:04	2:12	2:23	3:38	2:21	2:08	3:25	3:54	2:55
	Northern via Strathfield	2:29	2:42	3:31	3:11	3:15	3:44	2:15	3:19	4:01	3:01
	Western	2:42	2:23	3:13	3:12	3:24	3:38	2:24	3:15	4:17	3:08
T2	Airport & East Hills	2:47	2:41	2:39	4:50	2:53	2:33	2:25	3:02	2:53	2:32
	Inner West	2:51	2:26	2:36	4:13	5:04	4:16	3:19	4:05	5:00	3:45
	South	3:04	2:41	2:58	3:57	4:52	4:25	4:23	3:22	4:38	3:22
T3	Bankstown	2:06	2:11	1:54	2:40	2:52	2:14	2:01	2:02	3:03	2:18
T4	Eastern Suburbs	2:17	2:05	1:35	2:15	2:27	2:32	2:13	3:00	2:30	2:00
	Illawarra	2:11	2:40	1:38	2:32	3:24	2:47	3:03	2:41	2:26	1:54
<b>Suburban Overall</b>		<b>2:33</b>	<b>2:34</b>	<b>2:27</b>	<b>3:17</b>	<b>3:42</b>	<b>3:13</b>	<b>2:42</b>	<b>3:08</b>	<b>3:42</b>	<b>2:49</b>
<b>NSW Trains: intercity</b>											
Intercity	Blue Mountains	5:12	2:00	2:00	2:41	2:00	4:03	2:49	2:57	5:02	2:43
	Central Coast & Newcastle	2:25	3:00	2:43	2:42	3:04	6:40	3:12	4:22	5:30	4:51
	South Coast	2:27	3:15	2:02	3:26	4:22	3:04	3:35	2:54	2:34	2:24
	Southern Highlands	No trains timetabled to operate between the Southern Highlands and Central during the morning peak									
<b>Intercity Overall</b>		<b>2:37</b>	<b>2:55</b>	<b>2:20</b>	<b>2:51</b>	<b>2:57</b>	<b>4:41</b>	<b>3:15</b>	<b>3:34</b>	<b>4:29</b>	<b>3:29</b>

Note: Shading indicates target was not met.

Source: Transport for NSW.

## Afternoon Peak travelling away from Sydney CBD

Operator / Line		2015						2016			
		Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
<b>Sydney Trains: suburban</b>											
T1	North Shore	1:53	1:15	1:28	2:22	2:39	2:32	2:22	3:01	2:43	2:29
	Northern via Macquarie Park	2:00	1:29	1:56	2:40	3:35	2:31	3:18	2:54	2:41	2:26
	Northern via Strathfield	4:51	4:13	5:10	5:17	6:51	5:31	6:19	5:53	5:57	6:23
	Western	3:11	3:04	4:14	4:21	5:27	4:27	5:04	4:47	4:32	5:03
T2	Airport & East Hills	2:31	2:21	2:50	5:48	3:34	3:00	6:48	3:08	3:17	3:00
	Inner West	2:01	1:51	1:04	3:17	2:29	2:26	2:48	1:52	1:41	2:19
	South	3:48	4:10	4:41	7:10	5:34	4:20	6:00	4:32	4:56	5:33
T3	Bankstown	2:07	2:21	2:20	2:45	2:41	2:14	6:33	2:38	2:56	2:31
T4	Eastern Suburbs	0:25	2:15	0:32	1:04	2:20	1:48	2:35	1:16	0:48	0:27
	Illawarra	2:55	6:29	3:11	3:47	5:16	4:17	5:18	3:58	4:27	2:59
<b>Suburban Overall</b>		<b>2:50</b>	<b>3:19</b>	<b>3:15</b>	<b>4:18</b>	<b>4:36</b>	<b>3:32</b>	<b>5:09</b>	<b>3:44</b>	<b>3:53</b>	<b>3:37</b>
<b>NSW Trains: intercity</b>											
Intercity	Blue Mountains	4:32	4:59	6:17	4:39	8:12	6:46	8:33	7:42	4:59	7:45
	Central Coast & Newcastle	4:44	3:58	4:23	3:57	4:49	4:52	6:00	5:26	4:23	4:07
	South Coast	4:13	7:57	4:02	3:41	7:22	5:45	8:52	5:06	6:00	4:10
	Southern Highlands	10:00	11:00	15:00	13:00	14:00	10:00	17:00	21:00	9:18	6:00
<b>Intercity Overall</b>		<b>4:33</b>	<b>4:58</b>	<b>4:47</b>	<b>4:04</b>	<b>6:05</b>	<b>5:30</b>	<b>7:02</b>	<b>5:45</b>	<b>4:55</b>	<b>4:38</b>

Source: Transport for NSW

Note: Shading indicates target was not met.

## Exhibit A4.4: Punctuality of trains not passing Central from 1 July 2015 to 31 March 2016

Operator / Line		Operating between	Day of Week	
			Weekday	Weekend
<b>Sydney Trains: suburban</b>				
T2	South West	Leppington - Glenfield	98.7%	96.3%
T5	Cumberland	Campbelltown - Schofields	95.2%	97.1%
T6	Carlingford	Carlingford - Clyde	95.1%	96.9%
T7	Olympic Park	Olympic Park - Lidcombe	98.7%	96.3%
<b>Overall</b>			<b>98.8%</b>	<b>98.5%</b>

Source: Audit Office analysis of data from Sydney Trains

# Performance auditing

---

## **What are performance audits?**

Performance audits determine whether an agency is carrying out its activities effectively, and doing so economically and efficiently and in compliance with all relevant laws.

The activities examined by a performance audit may include a government program, all or part of a government agency or consider particular issues which affect the whole public sector. They cannot question the merits of government policy objectives.

The Auditor-General's mandate to undertake performance audits is set out in the Public Finance and Audit Act 1983.

## **Why do we conduct performance audits?**

Performance audits provide independent assurance to parliament and the public.

Through their recommendations, performance audits seek to improve the efficiency and effectiveness of government agencies so that the community receives value for money from government services.

Performance audits also focus on assisting accountability processes by holding managers to account for agency performance.

Performance audits are selected at the discretion of the Auditor-General who seeks input from parliamentarians, the public, agencies and Audit Office research.

## **What happens during the phases of a performance audit?**

Performance audits have three key phases: planning, fieldwork and report writing. They can take up to nine months to complete, depending on the audit's scope.

During the planning phase the audit team develops an understanding of agency activities and defines the objective and scope of the audit.

The planning phase also identifies the audit criteria. These are standards of performance against which the agency or program activities are assessed. Criteria may be based on best practice, government targets, benchmarks or published guidelines.

At the completion of fieldwork the audit team meets with agency management to discuss all significant matters arising out of the audit. Following this, a draft performance audit report is prepared.

The audit team then meets with agency management to check that facts presented in the draft report are accurate and that recommendations are practical and appropriate.

A final report is then provided to the CEO for comment. The relevant minister and the Treasurer are also provided with a copy of the final report. The report tabled in parliament includes a response from the CEO on the report's conclusion and recommendations. In multiple agency performance audits there may be responses from more than one agency or from a nominated coordinating agency.

## **Do we check to see if recommendations have been implemented?**

Following the tabling of the report in parliament, agencies are requested to advise the Audit Office on action taken, or proposed, against each of the report's recommendations. It is usual for agency audit committees to monitor progress with the implementation of recommendations.

In addition, it is the practice of Parliament's Public Accounts Committee (PAC) to conduct reviews or hold inquiries into matters raised in performance audit reports. The reviews and inquiries are usually held 12 months after the report is tabled. These reports are available on the parliamentary website.

## **Who audits the auditors?**

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards.

Internal quality control review of each audit ensures compliance with Australian assurance standards. Periodic review by other Audit Offices tests our activities against best practice.

The PAC is also responsible for overseeing the performance of the Audit Office and conducts a review of our operations every four years. The review's report is tabled in parliament and available on its website.

## **Who pays for performance audits?**

No fee is charged for performance audits. Our performance audit services are funded by the NSW Parliament.

## **Further information and copies of reports**

For further information, including copies of performance audit reports and a list of audits currently in progress, please see our website [www.audit.nsw.gov.au](http://www.audit.nsw.gov.au).

## Our vision

Making a difference through audit excellence.

## Our mission

To help parliament hold government accountable for its use of public resources.

## Our values

**Purpose** – we have an impact, are accountable, and work as a team.

**People** – we trust and respect others and have a balanced approach to work.

**Professionalism** – we are recognised for our independence and integrity and the value we deliver.

**Professional people with purpose**

Making a difference through audit excellence.

Level 15, 1 Margaret Street  
Sydney NSW 2000 Australia

**t** +61 2 9275 7100

**f** +61 2 9275 7200

**e** [mail@audit.nsw.gov.au](mailto:mail@audit.nsw.gov.au)

**office hours** 8.30 am–5.00 pm

[audit.nsw.gov.au](http://audit.nsw.gov.au)

