

AUDITOR-GENERAL'S REPORT

PERFORMANCE AUDIT

Managing Disruptions to CityRail Passenger Services



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 **Managing Disruptions to CityRail Passenger Services: RailCorp NSW**.

A handwritten signature in black ink, appearing to read "R J Sendt".

R J Sendt
Auditor-General

Sydney
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Foreword

About one in every twelve Sydney people travels by train each weekday.

Unplanned disruptions to services are inevitable, even on the best-run railways. Because of the complexities of Sydney's rail network, a single event can disrupt many services.

From a passenger's perspective, three issues are important -

- how quickly the disruption is fixed ("When will my train arrive?")
- the accuracy of information provided about the disruption ("Should I change my travel/meeting/other arrangements?")
- how often the disruptions occur ("Should I give up on rail travel?").

In this audit, we looked at how well RailCorp responds when there are routine disruptions to its CityRail passenger services. We focused on how RailCorp manages passenger journeys and informs passengers.

This report informs Parliament and the community about the limitations of the current system, and what more needs to be done in order to minimise the impact of disruptions on passengers.

It should also help passengers judge the extent to which they can rely on the information they receive, and to better understand some of the obstacles faced by staff.

Bob Sendt
Auditor-General

June 2005

Executive summary

Executive summary

RailCorp manages the Sydney metropolitan rail network and provides metropolitan and country passenger train services across New South Wales. CityRail is RailCorp's 'brand name' for its metropolitan passenger train services.

The New South Wales rail network is one of the most operationally complex networks in the world. On an average day, CityRail provides around 2,600 services carrying almost a million passengers, mostly to and from the CBD.

CityRail's reliability and on-time running performance reached its lowest level for a decade in 2004. Customer satisfaction levels, patronage and fare-box revenue have also declined.

This audit examines how well RailCorp recovers and informs passengers following unplanned routine disruptions to peak CityRail passenger services. Routine disruptions can arise from insufficient train crews, signal failures, poor weather, vandalism, passenger illness and the like. The audit does not examine the causes of disruptions, how well RailCorp repairs train, signal or track failures, or how well RailCorp copes with infrequent but major incidents such as the Waterfall rail accident or the Town Hall gas leak and evacuation.

Audit opinion

Routine disruptions to train services occur even on the most sophisticated rail networks. What influences a passenger's opinion of the service is:

- how quickly the operator resolves the problem and minimises the impact of the delay
- the provision of clear, accurate and timely information.

RailCorp is making a serious effort to improve its performance in managing disruptions. Much is being spent on improvements. It has a large number of projects underway that are developing and implementing long-term engineering solutions, new technology, timetable and staffing changes to help it reduce disruptions and recover faster.

But for the best part of the next decade, any major improvement in service quality will rely more on good day-to-day management and the performance of rail staff than these innovations.

RailCorp has initiated many programs to improve practices. But we believe that RailCorp needs to make a quantum leap to focus the business more on responding to passenger needs and achieving service excellence while we wait for the engineering solutions to reduce disruptions and enhance reliability.

We believe that RailCorp's efforts and resources need to focus intensively in the short term on better communication between staff and with passengers. Some of this is about systems and processes. Some of it is about staff being well informed and having a total passenger focus.

Summary of recommendations

This is a summary of more detailed recommendations contained in the body of the report at the cited page references.

We recommend that RailCorp:

Improve passenger service

- establish systems to better identify where and when communication during disruptions breaks down, give formal feedback to staff on their communication performance and recognise excellence in communication (page 30)
- ensure that station managers are rostered to work when they are most likely to be needed to manage and assist passengers (page 30)
- ensure that communicating clear, accurate and timely information during a disruption is a core accountability for rail staff (page 43)
- establish a suite of measures of group and individual performance in providing clear, accurate and timely information to passengers (page 43)
- require station management to make regular on-platform checks of the quality of information (page 43)
- establish, measure and report publicly against performance standards for 'peak passenger delay' (page 24)

Improve how it responds to a service disruption

- as part of its suite of planned improvements to the Rail Management Centre (RMC), develop response protocols to guide train controller decision-making and to facilitate a consistent response throughout the network (page 20)
- examine options for introducing computer-based decision support tools for train controllers (page 20)
- develop a more comprehensive set of guidelines for controllers, including the trade-off between keeping middle of the day services running after a disruption versus cancelling services in order to recover for the afternoon peak (page 21)
- review and, if necessary, redefine the peak service periods (page 22)
- seriously examine options to advance the 2008 target for ensuring that train controllers can locate trains on all parts of the network (page 22)
- examine alternate means of communicating controller decisions to reduce delays and errors (page 23)
- develop specific measures of the RMC's performance in terms of minimising the impact of disruptions on passengers (page 24)

Improve technology to help cope better with disruptions

- during disruptions make use of the long-line public address system when it achieves full station coverage in December 2005 (page 40)
- investigate ways to provide more specific information on the website, as initiatives to reduce network complexity and improve communication are implemented (page 40).

Key findings

Chapter 1: Introduction

RailCorp was created in 2004 from the amalgamation of the State Rail Authority and Rail Infrastructure Corporation. The metropolitan network is complex. It involves the operation of around 2,600 services carrying over 900,000 passengers to and from 306 stations daily.

At the time of this audit, on-time running performance was at its lowest level for at least ten years and rail safety was brought into particular focus in light of the Special Commission of Inquiry into the Waterfall Rail Accident.

Chapter 2: Deciding to intervene

The Rail Management Centre (RMC) manages the day-to-day operation of CityRail train services. Train controllers in the RMC decide what, if any, changes to make to train movements when there is a disruption to scheduled services.

Creation of the RMC in 2002 has improved RailCorp's capability to manage passenger journeys, but there is scope to further improve its effectiveness. To do this, RailCorp is implementing a project to improve RMC communication, supervision, guidance and quality systems. RailCorp is also addressing current 'dark areas' where controllers cannot 'see' the location of trains on the network.

Network complexity, structural elements of the current timetable, driver shortages and train crewing arrangements limit a controller's response options. To address this, RailCorp:

- is introducing a new timetable in September 2005
- has started the Rail Clearways program, which will allow the network to operate as discrete sectors
- has recruited more drivers and reduced training time
- will implement 'sectorised' weekday train crewing with the new timetable.

Disruptions to the afternoon peak are generally greater than the morning peak, because RailCorp is not always able to recover fully from morning delays before the afternoon peak starts. Understanding of the extent to which off-peak services should be sacrificed in order to recover before the start of the peak varies among controllers.

Present performance indicators do not show how well controllers are making trade-offs which are likely to advantage some passengers at the expense of others, and the extent to which they are achieving a 'net passenger benefit' from their interventions.

RailCorp is developing a measure of passenger delay. RailCorp, because it focuses on protecting and prioritising peak services, needs to redefine its peak service periods to align them with the busiest parts of the day.

**Chapter 3:
Communicating
changes to staff**

When there is a disruption and a controller decides to make a change to a scheduled service pattern, this decision must be communicated to signallers, train crews and station staff for it to take effect.

Communication between controllers, signallers, train crews, stations and others breaks down during service disruptions. RailCorp's communication technology supporting this function is cumbersome (and obsolete).

Despite these limitations, some staff at various locations interpret and pass on messages far more effectively than others. This shows an opportunity for improvement without technology.

More sophisticated train control systems will reduce the risk of communication breakdowns. RailCorp is gradually computerising signal control and is proposing to accelerate this program so that the heavy traffic parts of the network are computerised by 2012.

**Chapter 4:
Informing passengers**

When train services are disrupted, providing clear, accurate and timely information is critical to ensure passengers can choose the best alternatives to get to their destination and minimise their inconvenience. Knowing what is happening may also prevent passengers from becoming too distressed.

Although complaints about how well RailCorp communicates with passengers have been declining, passengers rate information received during disruptions as poor. We observed that where passengers receive advice, it is often delayed, inaccurate, inconsistent or incomprehensible.

RailCorp's passenger information systems are not fully automated and depend on staff updating them during service disruptions. Yet, the means by which staff on stations and trains learn of changes to train movements is unreliable (particularly during service disruptions).

We found that, even where railway staff receive information about changes to services, the timeliness, accuracy, and clarity of messages to passengers differs, depending on the station or train and who is on duty. These variations demonstrate an opportunity to improve and RailCorp has started several projects to enhance the quality and consistency of information provided to passengers.

Response from RailCorp NSW

On behalf of RailCorp, I would like to acknowledge the work of the audit team in capturing the many complexities that contribute to the way in which passenger information is provided when disruption occurs on the CityRail network.

While the audit notes that complaints about the quality of passenger information on the CityRail network have been declining, it does make a number of useful insights and recommendations for further improvements.

RailCorp has already taken a number of steps in the last 12 months to improve passenger information. These include:

- *The roll-out of computerised Train Location Systems at CityRail stations to assist station staff in knowing the timing and location of trains on the network so they may keep passengers informed;*
- *The introduction of new passenger information boards at major CBD stations to provide latest updates on how services are running;*
- *Better supervision, training and quality management within the Rail Management Centre so it may better cope with service disruptions, including the dissemination of appropriate passenger information;*
- *Better use of the CityRail website and Transport Information Line to provide up-to-date information on service disruptions;*
- *The development of clear plans and protocols for station staff in ensuring alternate transport is provided to customers in times of major disruption; and*
- *Provision of pagers to all guards and some station staff to enable direct messages to be sent about specific service changes.*

We also recently engaged a specialist in audio communications to research and provide advice on how customers best like to receive information. What was clear from this research was that passengers prefer manual announcements when information about service changes or disruption needs to be communicated. RailCorp will use the results of this research in conjunction with the findings of this audit to make further improvements in this area.

Given the mix of technology and human-based systems involved, getting passenger information right when incidents occur remains one of RailCorp's key priorities, and one of its major challenges. A core problem is the pressure placed on operational staff needing to make quick decisions about train movements, and at the same time inform those responsible for passenger information of those decisions so they, in turn, can provide accurate and timely advice to customers. This is where technology-based solutions will provide a better answer in the longer term.

The audit provides a good explanation of these various human and technology-based systems, looking at how and when they work, and the circumstances under which they may break down. In regards to the human factors, we agree with the audit that further focus on training and supervision of frontline staff will assist in improvements to passenger information in the short term.

The technology advances that need to be made are obviously more complex and costly. However, RailCorp is committed to exploring and introducing new technologies that will assist in ensuring passengers receive timely and accurate information at all times, and particularly during service disruptions when information is most needed.

RailCorp is also committed to reducing the number of incidents causing delays and is working on a number of plans to improve service reliability, commencing with the introduction of a new CityRail timetable in September this year. This was also acknowledged in the audit.

Finally, I would like to thank the audit team for the consultative approach they took in understanding the constraints and opportunities for improving passenger information on the CityRail network.

(signed)

*Vince Graham
Chief Executive Officer*

Dated: 3 June 2005

1. Introduction

At a glance

RailCorp was created in 2004 from the amalgamation of the State Rail Authority and Rail Infrastructure Corporation. It is responsible for managing the rail network and operating passenger trains in the greater Sydney metropolitan area.

The metropolitan network is complex. It involves the operation of around 2,600 services carrying over 900,000 passengers to and from 306 stations daily.

At the time of this audit, on-time running performance was at its lowest level for at least ten years and rail safety was brought into particular focus in light of the Special Commission of Inquiry into the Waterfall Rail Accident. Patronage, fare-box revenue and customer satisfaction levels have also declined over the last few years.

Yet disruptions are inevitable on even the best rail networks.

1.1 RailCorp

RailCorp operates the CityRail network

RailCorp is responsible for managing the metropolitan rail network and operating metropolitan and country passenger services. CityRail is RailCorp's 'brand name' for metropolitan passenger train services.

The CityRail network is large and complex

The CityRail network is complex. It involves the operation of around 2,600 services carrying over 900,000 passengers to and from 306 stations daily. The radial nature of the network makes the task of moving this number of people to and from work a challenge. Every day CityRail operates a fleet of more than 1,500 carriages over 2,060km of track controlled by over 2,500 signals.

It is focused on getting people to and from work in the CBD

About 60 per cent of peak morning trips are to the employment corridor bounded by Redfern and Chatswood. RailCorp advises that the number of services entering the CBD during peak times on most lines cannot be increased without network enhancements. The congested network and crowded trains contribute to the deteriorating reliability of services because of the dependency of each train on others on the network to meet its timetable and because of the additional time it takes to load and unload crowded trains.

RailCorp's funding agreement outlines its key objectives

RailCorp receives more than two-thirds of its funding from the Government and the remainder from the fare box. Government funding is provided through a funding agreement with the Ministry of Transport which requires RailCorp to:

- deliver clean, safe, secure and reliable railway passenger services in NSW in an efficient, effective and financially responsible manner
- enable the effective provision of safe and reliable passenger and freight services
- develop a strong safety culture and a commitment to excellent customer service.

The Government's service requirements of RailCorp are set out in the *Rail Performance Agreement between RailCorp and the Minister for Transport* covering the period 1 July 2004 to 30 June 2009. RailCorp is to deliver services and provide infrastructure in accordance with the above three outcomes that are also contained in this agreement.

To assess performance in achieving these outcomes, RailCorp provides a monthly report to the Minister covering specific performance benchmarks for reliability, capacity-demand matching and responsible asset management as well as other performance information set out in the agreement.

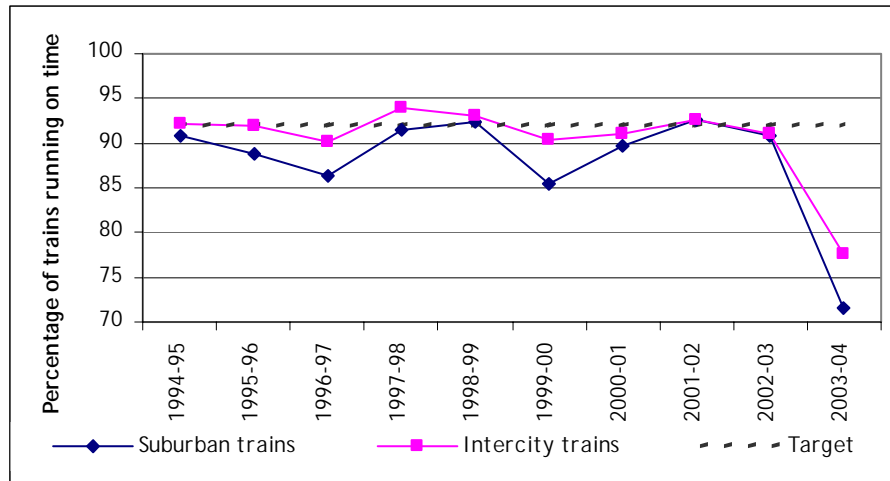
1.2 Recent performance

There have been substantial changes to rail over the last decade, but CityRail performance has been declining

Over the last decade, the Government has made changes to the organisational structure of rail designed to improve the efficiency and effectiveness of services.

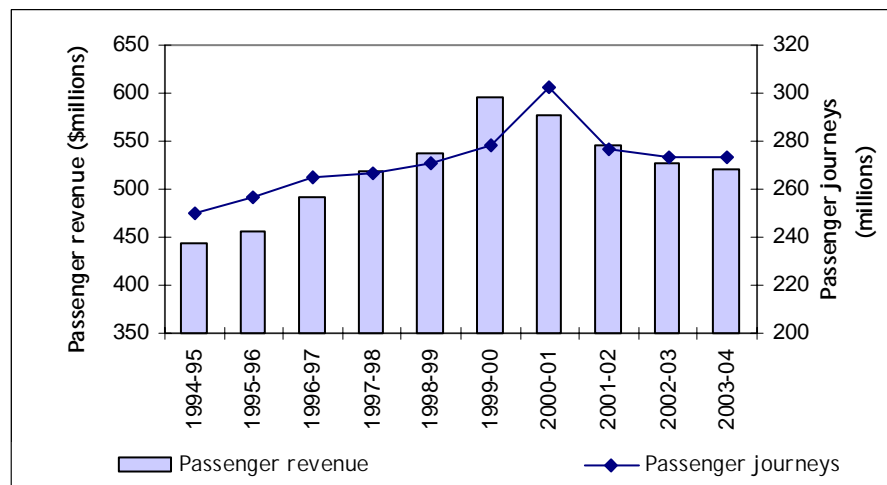
Recently, the performance of CityRail has declined in terms of on-time running, passenger journeys, fare-box revenue and customer satisfaction.

Exhibit 1: On-time running



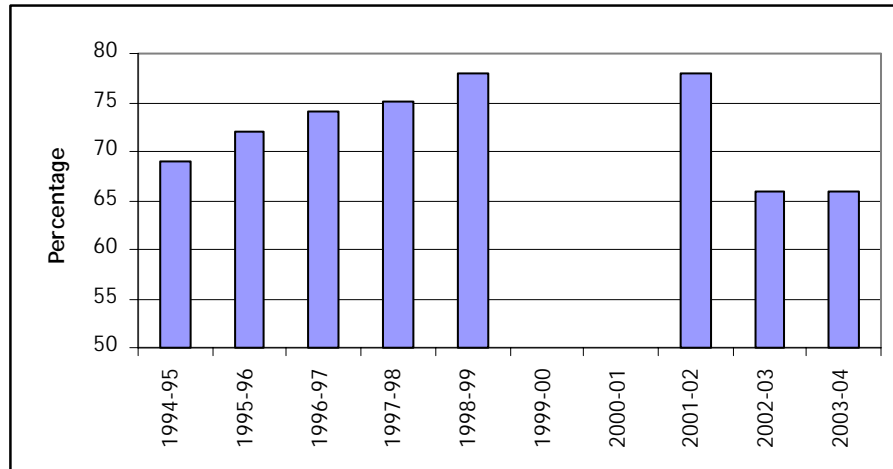
Source: RailCorp

Exhibit 2: Passenger journeys and revenue



Source: RailCorp

Exhibit 3: Customer satisfaction index



Source: RailCorp (Note: Data for 1999-2001 is not available)

A 2004 survey of passengers by the Independent Transport Safety and Reliability Regulator found:

Punctuality, train delays and cancellations, and crowding were the three issues of greatest concern to train users. These all relate to on-time running, which was particularly poor in the months prior to the survey.

Other issues of concern to train users were train frequency, the clarity, timeliness and content of announcements about delays and cancellations, and security in the evenings.

The Waterfall Inquiry was critical of safety and management

The recent Special Inquiry into the Waterfall Rail Accident (January 2005) was critical of RailCorp's safety practices, and questioned its capability to implement improvements and manage large-scale change.

The Government's response to the Inquiry (February 2005) indicated initiatives were in place to improve RailCorp's:

- communication practices and equipment
- approach to risk management and assessment
- incident management practices
- staff training
- corporate governance and accountability frameworks.

Many improvement projects are underway, but at early stages

RailCorp has initiated at least 63 major improvement projects, although many have yet to be implemented and some will take a long time to complete, such as Rail Clearways and computerisation of signal control.

1.3 Causes of delays

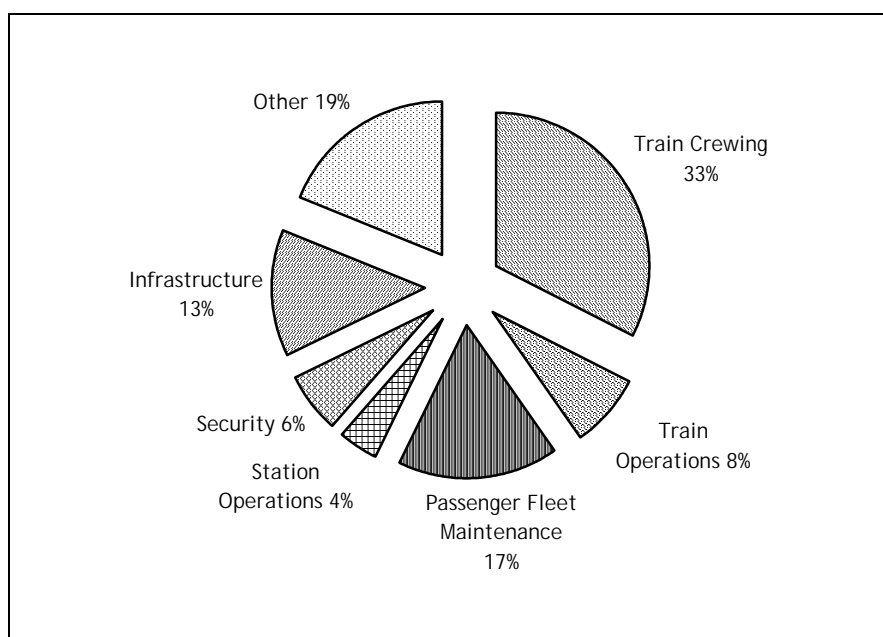
Many factors may cause CityRail passenger services to run late or be cancelled including:

- vandalism
- insufficient train crew
- train or signalling breakdowns
- passenger or train crew illness
- passenger fatality
- slow boarding or embarking passengers which affect the dwell times at stations
- severe weather conditions
- overcrowding in the centre carriages.

Problems with train crewing, trains and infrastructure are the main causes of peak delays

From January to March 2005, the main causes of peak service delays were problems with train crewing, mechanical failure of trains (ie passenger fleet maintenance), and track and signalling infrastructure breakdowns, as illustrated in Exhibit 4.

**Exhibit 4: Peak delays by cause - January to March 2005
(by RailCorp management area)**



Source: RailCorp 2005

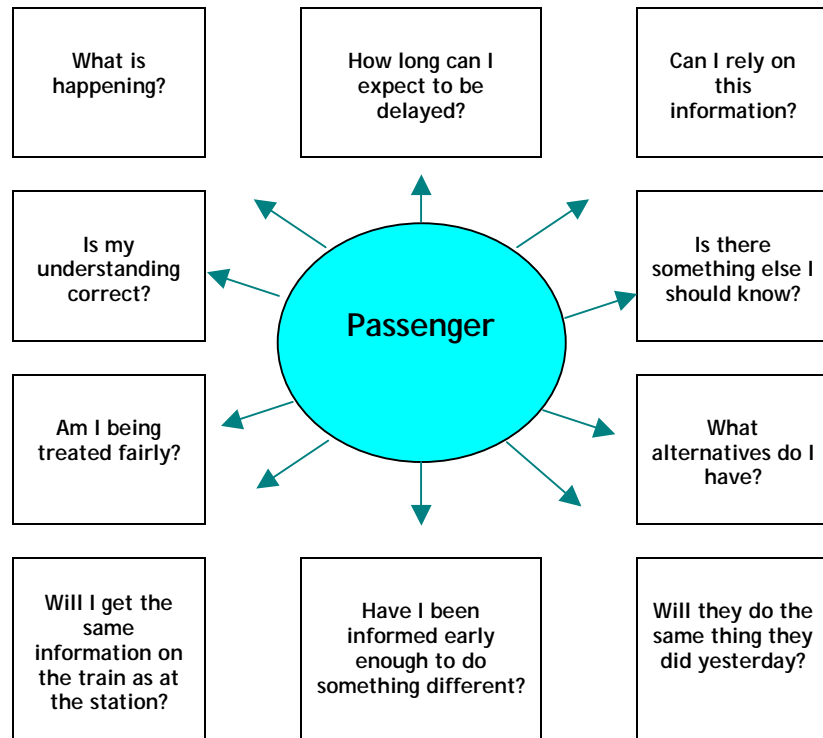
1.4 This audit

We adopted a passenger perspective to assess how well RailCorp copes with disruptions

This audit examined how well RailCorp manages unplanned routine disruptions to peak, CityRail passenger services. Routine disruptions can arise from insufficient train crews, signal failures, poor weather, vandalism, passenger illness and the like. We adopted a passenger perspective (Exhibit 5) to assess how well RailCorp manages journeys and provides information to minimise passenger inconvenience during a disruption.

We did not audit the causes of disruptions, how well RailCorp repairs train, signal or track failures, or how well it copes with infrequent but major incidents such as the Waterfall rail accident or the Town Hall gas leak and evacuation. Appendix 1, *About this audit*, provides more detail.

Exhibit 5: Disruptions from the passenger's perspective



2. Deciding to intervene

At a glance

The Rail Management Centre (RMC) manages the day-to-day operation of CityRail train services. Train controllers in the RMC decide what, if any, changes to make to train movements when there is a disruption to scheduled services.

Creation of the RMC in 2002 has improved RailCorp's capability to manage passenger journeys, but there is scope to further improve its effectiveness. To do this, RailCorp is implementing a project to improve RMC communication, supervision, guidance and quality systems. RailCorp is also addressing current 'dark areas' where controllers cannot 'see' the location of trains on the network.

Network complexity, structural elements of the current timetable, driver shortages and train crewing arrangements limit a controller's response options. To address this, RailCorp:

- is introducing a new timetable in September 2005
- has started the Rail Clearways program, which will allow the network to operate as discrete sectors
- has recruited more drivers and reduced training time
- will implement 'sectorised' weekday train crewing with the new timetable.

Disruptions to the afternoon peak are generally greater than the morning peak, because RailCorp is not always able to recover fully from morning delays before the afternoon peak starts. Understanding of the extent to which off-peak services should be sacrificed in order to recover before the start of the peak varies among the controllers.

Present performance indicators do not show how well controllers are making trade-offs which are likely to advantage some passengers at the expense of others, and the extent to which they are achieving a 'net passenger benefit' from their interventions.

RailCorp is developing a measure of passenger delay. RailCorp, because it focuses on protecting and prioritising peak services, needs to redefine its peak service periods to align them with the busiest parts of the day.

2.1 Background to the Rail Management Centre

The RMC brought together previously separate groups into a single train control facility

The Rail Management Centre (RMC) was opened in December 2002 to manage the day-to-day operation of train services on the network, and brings together a number of previously separate train control groups into a single facility. These groups comprise:

- train control
- rolling stock
- passenger security
- passenger information
- station operations
- train crewing
- signalling and track infrastructure.



Improving practice

The RMC has improved RailCorp's capability to manage passenger journeys during disruptions.

2.2 Changing train movements

Train controllers can change train movements

Train controllers in the RMC decide what changes to make to train movements when there is a disruption to scheduled services.

RailCorp advises controllers to resist intervention in the timetable, unless delays start to increase beyond four minutes.

Controllers will intervene in order to maintain service frequency, restore the timetable or to get passengers to their destination as soon as possible.

An intervention by a controller is called a transposition. Transposition options available to controllers include:

- cancellation of a service
- termination of a train
- skipping stations
- diverting trains
- utilising a stand-by train set
- swapping stopping patterns between trains.

Consequences of changes help some services recover at the expense of others

Transpositions have both negative and positive impacts on passengers. For example, a decision to skip station stops may help improve on-time running and reduce delays for some passengers, but will disadvantage passengers wishing to board or alight at the stations to be skipped. Similarly, a decision to cancel a service will disadvantage passengers who wished to use that service, but may help maintain on-time running or limit delays to the advantage of other passengers.

In making a decision to change a service, controllers obtain information on the disruption, and liaise with other controllers and staff in the RMC whose role is to advise them about the impact of changes on train crewing, rolling stock, infrastructure repairs, station matters, security etc. They may also discuss options with signallers.

The CityRail network is congested, complex and interconnected and disruptions during peaks escalate quickly to affect multiple services and lines. In order to minimise the impact of a disruption, controllers must make a decision quickly choosing the best possible options.

Decisions do not always minimise inconvenience

We found that these decisions may not always minimise the impact on passengers. There are a number of operational constraints which limit response options. There has been limited scenario planning and analysis to allow the RMC to identify and recognise options to adopt following a disruption to a service on a specific line. Controllers are also not able to locate precisely all trains on the network.

2.3 Factors which limit response options

There are three main factors which together limit the options available to a controller in deciding how to respond to a disruption, and make choosing options harder. These are:

- the complexity, inter-connection and congestion of the CityRail network
- the complicated CityRail timetable
- train crew rostering practices.

The network is complex and lines cross

RailCorp seeks to operate the CityRail network in three discrete sectors, so as to reduce the complexity of timetabling and better manage the interaction of a large number of services. Ideally, trains and crews would not travel from one sector to another, so that delays in one sector would not impact on the other two sectors.

However, the sectors cross, with each sector sharing some lines with others. The more segregated Sector 1 (Illawarra) is usually more reliable than Sectors 2 (South) and 3 (North and West).

Most other rail networks do not operate in this 'cross-sector' manner. The number of train services has increased over time, but expansion of track infrastructure in the main part of the network has not kept pace. This has forced the gradual breakdown of sectorisation.

The different service types using the network and different stopping patterns also complicate the operation of sectors. Five types of service use the CityRail network: country passenger, inter-city passenger, inner-suburban, suburban and freight. Each has different operating requirements and their interaction reduces the capacity and ability of the network to manage each task effectively.

For example, inter-city and freight trains cannot be restricted to individual sectors and some suburban trains cut across sectors. This increases the complexity of timetabling, decision-making during a disruption, and the chance of delays spreading across the network.

Exhibit 6: Crossed lines - effect on passengers

Website entry

Inner West, Western, Northern, North Shore & South Lines - Delays
CityRail advises that trains are being delayed on the Inner West Line in both directions due to earlier essential track equipment repairs at Ashfield. Flow on delays may be experienced to Western, Northern, North Shore & South Lines.

The timetable was designed in 1992, and is hard to operate in a disruption

Further, the last 'new' timetable was prepared in 1992. While there have been several incremental revisions to the timetable, the current timetable does not take into account changes in operating conditions since then such as longer dwell times and slower train speeds due to safety initiatives. This makes it difficult to operate, especially during periods of service disruption. Structural elements of the timetable, such as irregular stopping patterns and service frequency, also make disruption management between the morning and afternoon peaks difficult.

Train crewing arrangements are complex, and it is hard for controllers to get crews to their connection

During a disruption, controllers also need to ensure both drivers and guards get to their destination if they need to change trains. Otherwise, delays exacerbate. This is not easy because:

- suburban drivers and guards are not rostered together as a crew, and move separately between several trains during a shift
- working conditions differ between drivers and guards, including length of shift and maximum travelling distance
- drivers and guards move between sectors in the course of a shift, leading to accumulating delays across the network if trains are late and out of position (because the driver or guard is late to arrive for their connection)
- most crew changeovers occur at Central station, and it is difficult to transport crews to or from Central during a peak service disruption
- there are insufficient drivers to cover sickness, late arrival etc.

RailCorp plans to reduce these operational complexities as outlined below.



Improving practice

Sectorisation

The \$1 billion Rail Clearways plan announced in 2002 comprises 15 major infrastructure projects to increase sectorisation. The projects will build additional track, platforms, turnbacks and train crossing loops to allow trains to move more freely within their sector. It is due for completion in 2010. RailCorp is currently determining the operational strategies it will pursue to maximise the benefits of Rail Clearways, which may include sectorisation of train crewing, fleet and train control.



Improving practice

New timetable

RailCorp is developing a new CityRail timetable for introduction in September 2005. It expects the new timetable to be easier to operate during disruptions, because it has been designed to provide:

- more consistent, less complex stopping patterns
- longer journey times
- more fresh trains and train crews for the afternoon peak
- greater scope to recover before the start of the afternoon peak
- less movement of train crew between sectors.



Improving practice

Train crewing

RailCorp believes the introduction of more sectorisation of train crewing with the September 2005 timetable will result in:

- more drivers and guards working together as a crew
- disruptions on one sector affecting less services on other sectors, as crews will be less likely to arrive late
- reduced changeovers at Central, with staff being relocated to depots at locations where trains start and finish their runs.

Following certification of its 'core' enterprise agreement, RailCorp intends to commence negotiating a 'functional' enterprise agreement which it hopes will simplify and harmonise train crew working conditions.

RailCorp has increased driver recruitment and reduced training time. It will achieve a significant increase in driver numbers by the middle of this year. It also plans to further decrease training time.

2.4 Improving the effectiveness of the RMC

Several other factors limit the RMC's effectiveness

While recognising the impact of the operational complexities described above, a 2004 review of the RMC found there were several other factors limiting its effectiveness including:

- communication between parties in the RMC, and between the RMC and other parts of RailCorp, was inefficient and often failed
- reporting and command structures were ambiguous
- protocols were not always complied with
- procedures provided limited guidance to staff
- scenario planning and review was rare
- controllers could not 'see' the precise location of trains on parts of the network (see section 2.7).

An RMC reform project is under way



Improving practice

In October 2004, RailCorp commenced a project to better prepare the RMC to cope with service disruptions which will:

- clarify individual responsibilities and accountabilities, and review key supervisory roles
- develop and enhance existing procedures and protocols for decision-making and communication
- develop contingency plans and standard response options, through scenario planning
- implement document-control, quality assurance and continuous improvement systems including the introduction of ISO 9000 to improve compliance.

The RMC does not use computer-based tools to access large volumes of data and support decision-making by controllers. The Special Commission of Inquiry into the Glenbrook Rail Accident recommended that RailCorp implement "computer generated solutions to assist controllers to minimise or avoid disruptions to normal operations". Some overseas rail networks use computer-based decision support tools.

Recommendation

As part of its suite of planned improvements to the RMC, it is recommended that RailCorp:

- develop response protocols to guide controller decision-making and to facilitate a consistent response throughout the network
- examine options for introducing computer-based decision support tools for controllers.

2.5 Protecting the afternoon peak

Disruptions in the morning often cause delays throughout the day

Disruptions to the afternoon peak are generally greater than the morning peak, because RailCorp is not always able to recover fully from morning delays before the afternoon peak starts. To illustrate, between January and April 2005, CityRail's weekly on-time running performance was always worse in the afternoon than the morning peak.

RailCorp recognises the importance of recovering the timetable before the start of the afternoon peak. If services are not at or near schedule at the beginning of the peak, there is little or no chance that recovery will occur during the afternoon peak. The likelihood is that delays will escalate.

There are constraints to recovery in the middle of the day

To attempt to recover, train controllers use transpositions, and from time to time RailCorp replaces services with buses. The inter-connection of the network, train crew rostering practices and the complicated timetable make it hard for RailCorp to recover between the morning and afternoon peaks. The capacity to recover in the middle of the day is further constrained by:

- restricted track availability, which limits the capacity for controllers to move trains around others, because the track is being used for other purposes such as freight train operations (they do not operate during the peaks) and track inspections
- the frequency of inter-peak services on the network.

RailCorp is working to recover better during the middle of the day

The timetable, train rostering and sectorisation improvements outlined above should help reduce the need for recovery between the peaks, and also make it easier to recover after the morning peak. RailCorp is also:

- implementing strategies to reduce the impact of track inspections on track availability
- trialling the use of stand-by trains to provide an inner-west 'shuttle' service which substitutes for late running scheduled services, allowing these to proceed as quickly as possible to where they are needed for the afternoon peak
- examining options to reschedule freight train services with poor reliability well outside the morning peak.

There is a need for stronger guidance for controllers

However, understanding of the extent to which off-peak services should be sacrificed in order to recover before the start of the peak varies among controllers. We concluded that there was a need for train controllers to be given greater guidance about the relative importance of maintaining off-peak services and the need to recover before the start of the afternoon peak.

Recommendation

It is recommended that RailCorp develop a more comprehensive set of guidelines for controllers, including the trade-off between keeping middle of the day services running after a disruption versus cancelling services in order to recover for the afternoon peak.

2.6 Redefining the peak

The defined peak is no longer the actual peak

RailCorp defines the morning peak as services arriving at Central station between 6.00 am and 9.00 am, and the afternoon peak as services departing Central station between 4.00 pm and 6.00 pm inclusive, from Monday to Friday. Yet patronage data indicates:

- the busiest entry hour at CBD stations is now 5.00 pm to 6.00 pm, and the pm peak is continuing much later than 6.00 pm
- the busiest three hour period in the morning is now 7.00 am till 10.00 am.

RailCorp's focus is on protecting and giving priority to peak services, while restricting freight movements on the network during peak periods. Also, its key reliability performance indicator is peak on-time running, so it is important that the defined peak represents actual passenger movements.

Recommendation It is recommended that RailCorp review and, if necessary, redefine the peak service periods.

2.7 Improving visibility

Controllers can't see all the trains on the network

Train controllers can 'see' the location of trains on about two-thirds of the network and can access live images from security cameras on stations if they need to check arrivals, departures or possible overcrowding. However, the 'dark areas' make it difficult for controllers to see implications across the network and to quickly arrive at an acceptable strategy.

The need to eliminate dark areas for controllers has been identified in several inquiries and reviews since 2001, most recently in the Special Commission of Inquiry into the Waterfall Rail Accident (2005).



Improving practice

Dark areas for signallers have been eliminated in line with a recommendation of the Special Commission of Inquiry into the Glenbrook Rail Accident (2001).

RailCorp is progressively eliminating dark areas for controllers. Dark areas now comprise approximately 33 per cent of the CityRail Network, compared to 65 per cent in April 2002. RailCorp expects 90 per cent coverage of the greater Sydney metropolitan area by 2008.

This is a very necessary improvement. Available resources necessarily limit reforms. However, this issue is so important that the 2008 target seems a very long way away. Improving this target would be of great benefit.

Recommendation It is recommended that RailCorp seriously examine options to advance the 2008 target for ensuring that train controllers can locate trains on all parts of the network.

Exhibit 7: Rail Management Centre



2.8 Communicating decisions in the RMC

At the time of a decision, communication within the RMC is largely reliant on face-to-face and telephone communications, and frequently breaks down during disruptions.

There is no system to automatically disseminate in text form decisions by controllers to others in the RMC, or to signallers, station staff or train crews.

Recommendation

It is recommended that RailCorp examine alternate means of communicating controller decisions to reduce delays and errors.

2.9 Ordering buses

Ordering buses is difficult during the peak

In the event of a major disruption, the RMC will order buses to replace trains. Replacing train services with buses quickly during the peak is difficult because:

- peaks for buses and trains often coincide
- the capacity of a bus is about eight per cent of a train, so a dozen or more buses are needed per train
- available buses often have to travel long distances to the pick up point
- stations are not designed to cater for large numbers of buses, and the passengers boarding them
- buses often have to travel long, slow, convoluted routes to get passengers to stations, limiting the number of runs they can make.



Improving practice

The ordering of buses by the RMC is a relatively recent initiative, and has led to some confusion at stations. RailCorp is developing station-specific plans to guide the RMC and station staff in who is responsible for ordering buses, pick-up points, routes, crowd management etc. We expect this will improve outcomes for passengers.

2.10 Measuring success

No specific measures of the success of the RMC

At present, the measures used to judge the RMC's performance in managing passenger journeys are on-time running, station stops skipped and passenger complaints.

These, however, are measures of the performance of CityRail, not the RMC. While the RMC contributes to these outcomes, its role is to ensure safety and minimise the impact of a disruption on passengers.

To illustrate, CityRail reliability is currently very poor, stemming from a range of factors including network congestion, train crew shortages and freight train breakdowns. RailCorp could not separate the performance of the RMC from overall CityRail performance in order to demonstrate to us how well the RMC has performed during this difficult time. As a result, we could not tell whether the RMC has exacerbated or limited passenger delays.

We recognise this will not be easy. RailCorp will need to clearly define the RMC's objectives and specific value-adding contributions, and measure aspects of that.



Improving practice

Work discussed above to improve the preparedness of the RMC, including scenario planning, modelling and enhanced procedures, may help identify indicators of success such as timeliness of decision, compliance with protocols, internal customer satisfaction, and overcrowding at stations.

It is also important that RailCorp be able to assess the performance of both the RMC and the organisation as a whole in minimising passenger inconvenience.

At present, RailCorp's key performance indicator of reliability is peak on-time running. On-time running is an important operational performance measure. However, it may understate or overstate the inconvenience caused to passengers. To illustrate, on-time running may be poor, but passengers may catch a late running service at their normal time which gets them to their destination at the expected time, so they experience no real delay.

As discussed, when there is a disruption controllers may alter train movements to maintain on-time running and minimise delays. RailCorp also measures and reports publicly against targets for station stops skipped and percentage of services run.

It is not clear how well controllers make trade-offs

Reporting of peak on-time running, station stops skipped and percentage of services run may provide a total picture of the health of the service but may send conflicting messages to a controller who is trying to minimise passenger inconvenience. These indicators do not show how well controllers are making trade-offs which are likely to advantage some passengers at the expense of others, and the extent to which they are achieving a 'net passenger benefit' from their interventions.



Improving practice

ITSRR recommended in 2004 that RailCorp establish a measure of 'passenger delay'. Since then, RailCorp has been working with ITSRR on how best to define and measure this.

This measure would also make it clear for all that RailCorp's objective is minimising passenger inconvenience, thereby supporting RailCorp's efforts to instil a passenger focus in its staff.

Recommendation

It is recommended that RailCorp:

- develop specific measures of the RMC's performance in terms of minimising the impact of disruptions on passengers, such as timeliness of decision, compliance with protocols, internal customer satisfaction, and overcrowding at stations
- establish, measure and report publicly against performance standards for 'peak passenger delay'.

3. Communicating changes to staff

At a glance

When there is a disruption and a controller decides to make a change to a scheduled service pattern, this decision must be communicated to signallers, train crews and station staff for it to take effect.

Communication between controllers, signallers, train crews, stations and others breaks down during service disruptions. RailCorp's communication technology supporting this function is cumbersome (and obsolete).

Despite these limitations, some staff at various locations interpret and pass on messages far more effectively than others. This shows an opportunity for improvement without technology.

More sophisticated train control systems will reduce the risk of communication breakdowns. RailCorp is gradually computerising signal control and is proposing to accelerate this program so that the heavy traffic parts of the network are computerised by 2012.

3.1 Communicating decisions

When there is a disruption and a decision is made by a train controller to change a train movement, this decision has to be communicated to a number of people for it to take effect. For example:

- signallers may have to alter the signals to achieve the desired change to train movements
- signallers may have to advise station staff of the changes (including to train order, stopping patterns and platforms on which trains will arrive)
- train crews have to ensure they stop at the right stations, and advise passengers of changes
- station staff may have to issue transposition slips to crews, control crowds, manage dwell time, and inform passengers.

Complete, accurate and timely information is essential for the controller's decision to be implemented properly, and passenger journeys to be well managed.

Communication between staff breaks down during disruptions, so that controller decisions are not implemented as intended

We found that messages between controllers, signallers, train crews, stations and others may break down during service disruptions because:

- of poor communication technology which is largely voice-based (ie limited use of text messages) so that there is a reliance on staff listening to and then conveying messages
- there are many staff at many locations involved in receiving a message, acting on it, and conveying to others the changes made, and therefore many chances of the message changing or not being passed on
- some staff at some locations are better able to communicate controller decisions than others.

As a result, decisions may not always be implemented in time or as the controller intended.

3.2 Basic communication technology

Some RailCorp communication technology is cumbersome and obsolete

The communications technology used by RailCorp to advise of train movement changes is cumbersome (and obsolete). Once a controller decides to change a train movement, signallers, stations, and train crews are advised of changes largely via telephone, radio or fax communications. Changes are not conveyed automatically or, for the most part, in text formats.

Exhibit 8: Sefton signal box (mechanical)



Exhibit 9: Strathfield signal box (electrical)



Some of the problems experienced include:

- the 'x' ring telephone system through which signal boxes and stations communicate is an antiquated party-line system, and station staff may have difficulty hearing the signaller on the 'x' ring, or may not answer because they are attending to a passenger or performing other duties
- station staff may not routinely check the facsimile machine
- mobile phone coverage is affected by blackspots in transmission.

RailCorp is in the process of implementing computerised signal control. This will modernise communication technology in the longer term, and is discussed in section 3.6.



Improving practice

Whilst awaiting computerised signal control, RailCorp has been implementing incremental improvements to its communication technology.

For example, RailCorp now uses pagers to notify train guards and some senior station staff of service disruptions. RailCorp is in the process of upgrading pagers so that it can direct messages to only those services affected (whereas currently, a generic message is provided that lists all disruptions on the network).

RailCorp is gradually rolling-out the Train Location System (TLS) which enables station staff to see where trains are on the network and reduces their reliance on telephone calls from the signal box. It is now available at 201 (out of 306) stations and covers about two-thirds of the network. The TLS allows station staff to see where a train is and provides advanced notice of late running services or cancellations. On these stations, passengers can receive more up-to-date information regarding delays and disruptions.

The TLS does not eliminate the reliance of station staff on signallers and the RMC to advise them of the reasons for delay, changes to future stopping patterns or changes to the platform on which a train will arrive.

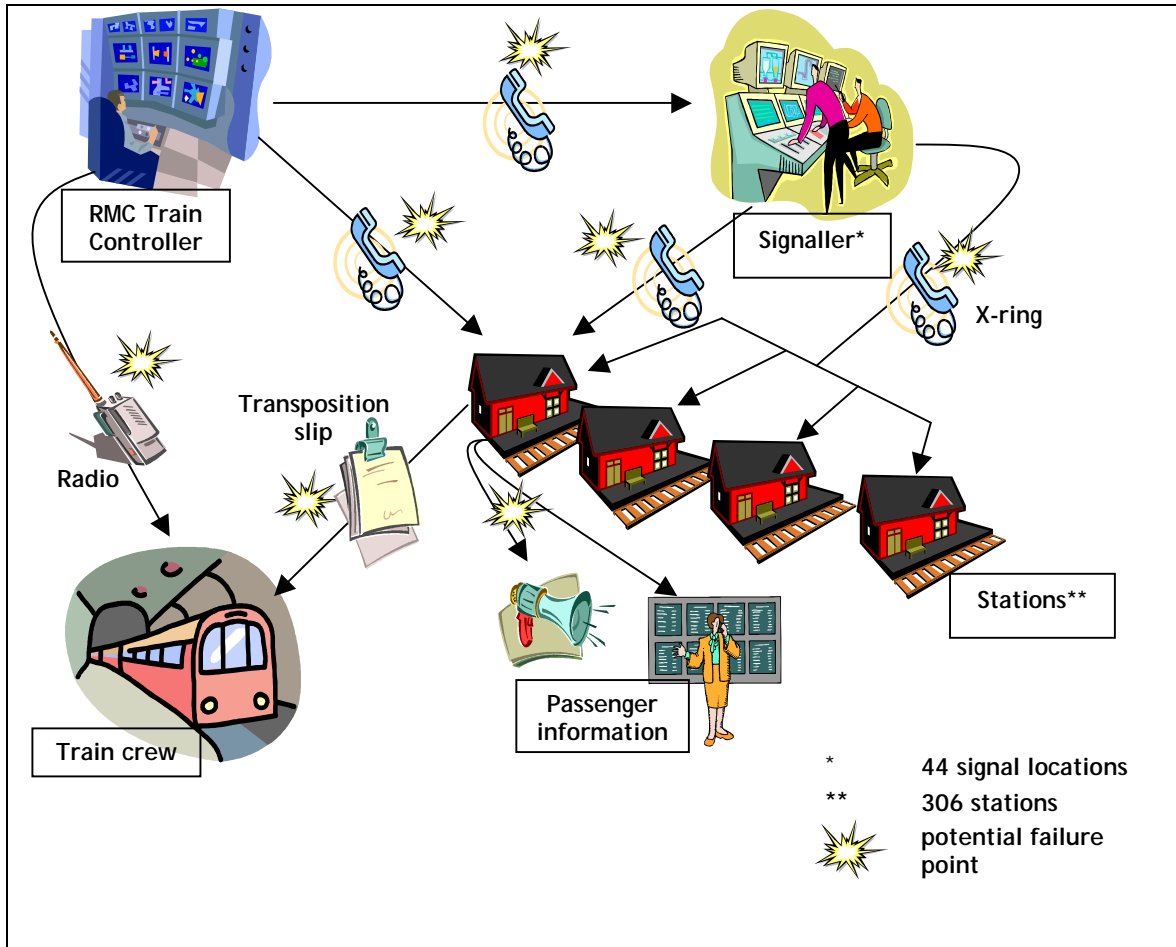
3.3 Many staff are involved in conveying a message

Many staff have to receive and convey messages

The more staff involved, the greater the risk that a controller's decision is not implemented correctly. Many staff at many locations are involved in:

- interpreting a message
- responding and making changes
- conveying the changes to others.

Exhibit 10: Changing train movements with current manual technology



Source: RailCorp 2004

Communication breaks down, but performance varies

When services are disrupted, controllers, signallers, station staff and train crews focus on train movements. In these circumstances, communication between them (and therefore passengers) may break down, and changes to train movements may not occur as the controller intended.

But some staff at some locations communicate better and respond more effectively than others during a service disruption. As a result, passengers may be better informed of choices and their journeys better managed depending on when and where they are on the CityRail network. This variability in performance demonstrates opportunity to improve the implementation of controller decisions and passenger information, while we wait for technological and engineering solutions which may take some time.

In order for RailCorp to take advantage of this opportunity, it will need to hold staff accountable for their performance in implementing decisions and conveying messages, and recognise and reward good performance. This will require RailCorp to develop a better understanding of when and where communication breakdowns occur.

Recommendation It is recommended that RailCorp establish systems to better identify where and when communication during disruptions breaks down, give formal feedback to staff on their communication performance and recognise excellence in communication.



 **Improving practice**

Exhibit 11: Station Operations Service Disruption Guide

Central Station developed a short guide to assist station staff to respond effectively during a service disruption.

It includes key telephone numbers, and a summary of the duties of each staff member during a disruption.

This guide is now being rolled-out to staff working in other major stations.



Source: RailCorp 2004

3.4 The importance of station managers

Station managers are not always on duty when they are most needed to assist passengers

It is important that station managers are on duty when they are most needed to manage and inform waiting passengers. This is not always the case.

Exhibit 12: When are station managers on duty?

Station managers may roster themselves to work morning or afternoon shifts, on weekdays and weekends. There is no requirement for them to be on duty when they are most likely to be needed, and they are not on call when they are not on duty.

For example, a CBD station manager could choose to work morning shifts and on the weekend, whereas their skills and experience are most likely to be needed during the weekday afternoon peak because:

- there is greater risk of a service disruption in the afternoon peak (compared to the morning peak)
- most passengers board trains at CBD stations during the afternoon peak, passengers most need information when they are boarding trains, and this is when crowd control measures may be needed.

Recommendation It is recommended that RailCorp ensure that station managers are rostered to work when they are most likely to be needed to manage and assist passengers.

3.5 Improving day-to-day management

RailCorp is implementing projects to improve staff skills

RailCorp is in the process of implementing several projects to improve performance in communication and reduce the risk that controller decisions are not implemented. These are designed to improve its:

- procedures and protocols
- supervision and accountability
- staff training.



Improving practice

For example, the Station Reform Program, due for completion in November 2005, proposes:

- station managers to be accountable for managing all aspects of their station or cluster of stations, to be at work when they are most needed and on-call at other times
- to appoint station operations superintendents and station incident response officers, to provide extra supervision during peak times, and operational support for incident response
- establishment of a special event and major possessions work force, which will also facilitate release of the station team for training
- to enhance incident management protocols and procedures.



Improving practice

Exhibit 13: Some recent improvement initiatives

Customer Services Local Incident Management Plan project

This project followed a severe service disruption at Hornsby in December 2004. RailCorp found that the response to this incident by stations and the RMC was at times inconsistent and fragmented and lacked the detail that a local incident plan would provide. An RMC customer services local incident management plan for Hornsby has been developed, and it is being used as a prototype for local incident management plans at other major stations.

Station and signaller communication workshops

RailCorp is conducting a series of workshops to improve communication between signallers and station staff. The aim is to identify better communication methods, establish communication protocols and develop a network-wide communication manual.

Customer Service Volunteers

After the suspected gas leak incident at Town Hall station in February 2004, RailCorp developed a Customer Service Volunteers program. A pool of RailCorp office staff have been trained and equipped to assist station staff in CBD evacuation and crowd control. At present there are 90 volunteers who can be deployed to Central, Town Hall, Wynyard and North Sydney stations.

Deployment of Transit Officers

During disruptions, RailCorp now deploys Transit Officers to assist with crowd management and passenger service.

In order to promote more structured and consistent management of disruptions, it is important that the response protocols developed as part of the planned improvements to the RMC are used to develop local response protocols.

3.6 Improving technology

Computer technology can:

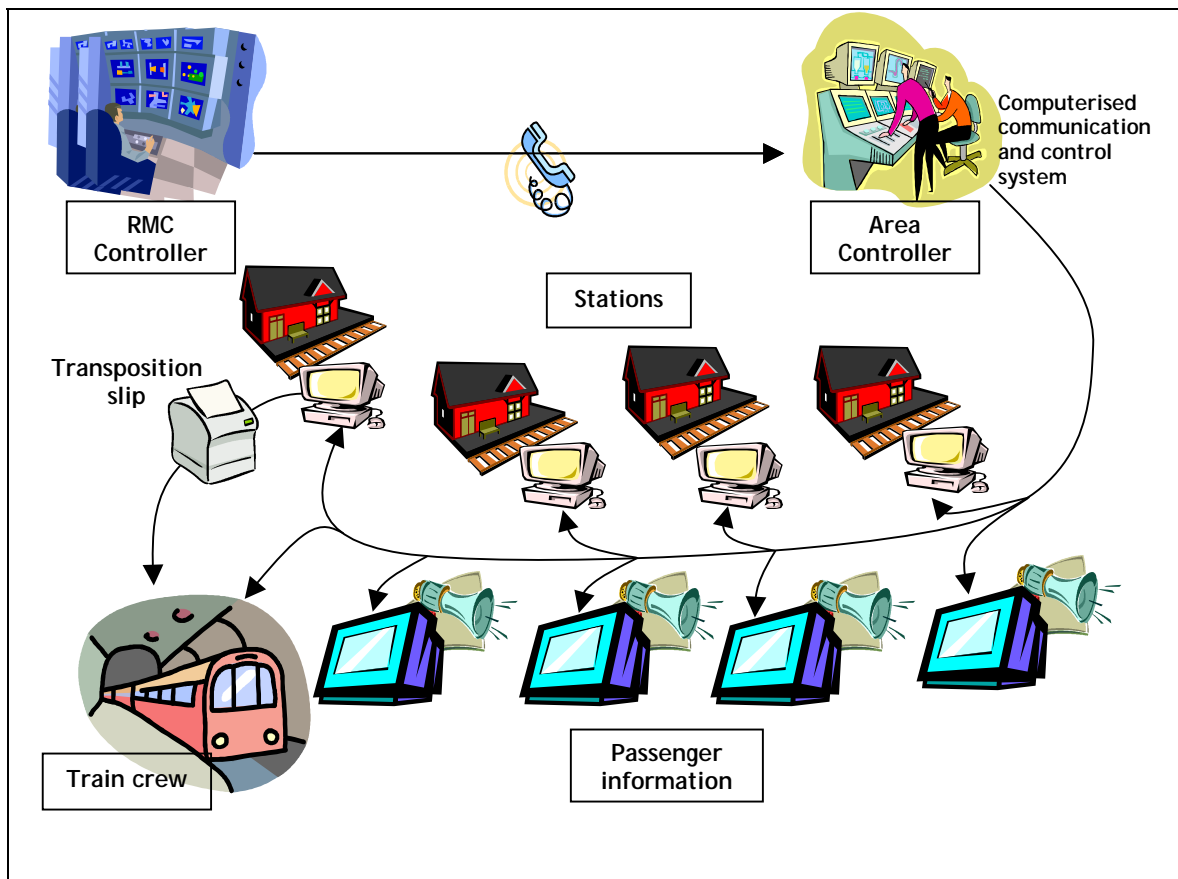
- increase visual messages, reducing the need for voice communications
- automate distribution of real time information to signallers, stations, trains and passengers.

International practice

Many Australian and international rail networks have computerised signal control.

The following diagram shows how a decision to change a train movement would occur with computer technology.

Exhibit 14: Changing train movements using computerised signal control



Source: RailCorp 2004

Only a small part of the CityRail network is computerised

Implementation of computerised signal control started in early 2000. Currently only three of 44 metropolitan signal control locations have been computerised, ie only some lines covered by Sydenham and Strathfield, and Blacktown, are computerised. The remaining 41 signal locations are either electrical or mechanical 'manual' systems.

Exhibit 15: Sydenham signal box (computerised)



A new Metropolitan Signal Control Strategy is being developed

To address this, RailCorp is developing a new Metropolitan Signal Control Strategy. RailCorp advises that the Strategy will:

- accelerate implementation of computerised signal control so that all high-traffic areas of the network are covered by 2012
- establish signal control centres at Strathfield and Sydenham, thereby reducing the number of signal locations and staff involved in interpreting and conveying messages about changes to train movements
- introduce automatic route setting capabilities, to reduce risk of signaller error.

RailCorp is also currently reviewing controller and signaller work loads to identify the feasibility of a combined signaller/controller position.

We believe that computerised signal control will improve communication and reduce the risk of controller decisions not being implemented correctly.

RailCorp advised that Board approval of the Strategy will be sought once further analyses of financing, industrial relations, risks and delivery strategies have been undertaken.

4. Informing passengers

At a glance

When train services are disrupted, providing clear, accurate and timely information is critical to ensure passengers can choose the best alternatives to get to their destination and minimise their inconvenience. Knowing what is happening may also prevent passengers from becoming too distressed.

Although complaints about how well RailCorp communicates with passengers have been declining, passengers rate information received during disruptions as poor. We observed that where passengers receive advice, it is often delayed, inaccurate, inconsistent or incomprehensible.

RailCorp’s passenger information systems are not fully automated and depend on staff updating them during service disruptions. Yet, the means by which staff on stations and trains learn of changes to train movements is unreliable (particularly during service disruptions).

We found that, even where railway staff receive information about changes to services, the timeliness, accuracy, and clarity of messages to passengers differs, depending on the station or train and who is on duty. These variations demonstrate an opportunity to improve and RailCorp has started several projects to enhance the quality and consistency of information provided to passengers.

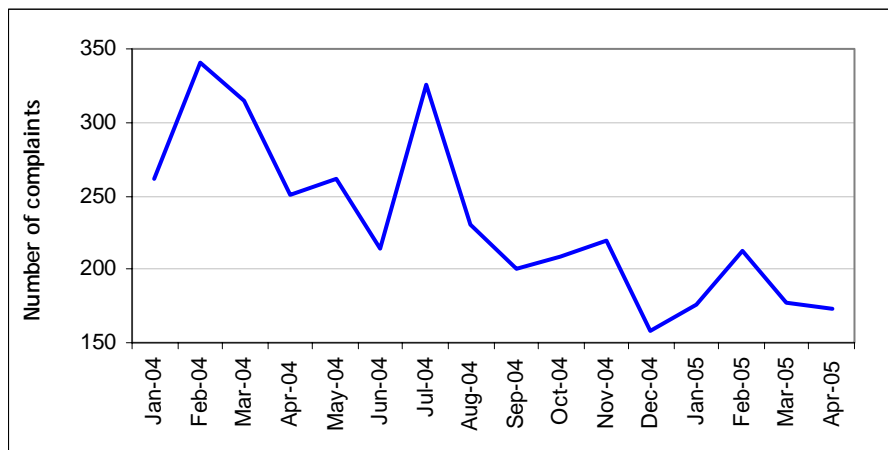
4.1 Quality of information provided to passengers

When train services are disrupted, providing clear, accurate and timely information is critical to ensure that passengers can choose the best alternatives to get to their destination and minimise their inconvenience.

Complaints about information have been declining

The number of complaints about how well RailCorp communicates with passengers has been declining.

Exhibit 16: Passenger complaints about information



Source: RailCorp 2005

A recent passenger survey by the Independent Transport Safety and Reliability Regulator (ITSRR) found that more than three-quarters of rail users rated information and communication as important, and almost one in five indicated that improvements to information and communication were among their top three priorities. Aspects of information and communication where expectations were best met included:

- signs on stations
- the CityRail Website
- the 131 500 telephone service.

But passengers rate information received during a disruption as poor

Areas where passenger expectations were not met included:

- clarity of announcements on the train
- timeliness of announcements about delays
- information about delays and cancellations
- clarity of announcements on the platform.

In each case, more than one-third of passengers surveyed rated their importance as high, but performance as low.

Information not always clear, timely and accurate

We found that when services are disrupted, information to passengers is sometimes delayed, inaccurate, incomprehensible or incomplete because:

- passenger information systems are not fully automated and depend on staff updating them during service disruptions (see section 4.2)
- station staff and train crews often do not have access to accurate, real-time information on train locations and delays. As discussed earlier, the means by which they learn of changes to the train schedule is unreliable (particularly during service disruptions)
- railway staff do not always communicate the information they have in a timely, accurate, consistent or comprehensible manner.

4.2 Passenger information systems

Passenger information systems are not fully automated and depend heavily on staff changing them during a service disruption.

Station Passenger Information (SPI) systems are installed at 31 stations (out of 306), including all the Sydney CBD stations.

Those stations that do not have SPI systems have wooden roll-over or metal indicators which are operated manually by staff. Unmanned stations have copies of the printed timetable displayed.

Technology at stations requires staff to update information

The SPI systems comprise electronic visual display screens on platforms and station entrances and digital voice announcements that indicate stopping pattern and expected arrival time.

The SPI systems operate off best available information. In some locations, staff have to manually update all train information. In others they have to intervene only when there is a stopping pattern or destination change. When there are severe disruptions, if station staff are overwhelmed by the volume of changes they switch off the SPI and make manual announcements.

Exhibit 17: Station Passenger Information visual display screen



Not all public address systems work well

Most stations have public address systems. Yet, we observed that the speakers on many stations are old and cover a large area. Passengers on stations with multiple platforms experience difficulty in understanding messages when various announcements are made at the same time. There is usually not an even spread of speakers across platforms, and passengers at the end of platforms often cannot hear messages clearly, or if they can the volume is too high elsewhere.

In addition to timetable information, station announcements include safety and security messages. This can create a distraction to announcements about changes to timetable during a disruption.

Long-line public address announcements can be made from the RMC or from local GRMLs. Eighty-four of 306 stations do not yet have long-line public address systems.

Exhibit 18: Problems with passenger information

Some examples of problems we observed with passenger information were:

- the SPI visual display screen at Wynyard indicated the next Hornsby train was due in 19 minutes. After five minutes, the screen indicated it was due in 17 minutes, and then immediately it dropped to two minutes. Similar examples occur frequently on all lines
- the inter-city service was delayed, but the speaker on the carriage was not working properly and the guard's announcement was incomprehensible
- the distance between the end of a Penrith platform and the closest speaker made it difficult to hear announcements
- during a severe disruption caused by a fatality at Ashfield, staff took over announcements at Wynyard. When these could be heard, they were clear and precise. But often they were drowned out by station noise including trains arriving and departing from the opposite platform.

Technology on trains relies on guards to make changes to messages

Passenger information systems on most trains comprise guard's announcements and rely on the train's public address system being in good working order. This is not always the case. The Millennium train has a digital voice announcement system and visual displays which show stops according to the timetable.

Website and telephone rated highly

The CityRail website and 131-500 telephone service provide brief information on the line affected, the cause, and an estimate of likely delays.

Exhibit 19: Typical message on Website

Service Interruptions

Posted 11/03/05 03:09pm

Suburban Rail Network except the Eastern Suburbs & Illawarra Line - Delays of up to 20 minutes

CityRail advises that trains are being delayed on the Suburban Rail Network except the Eastern Suburbs & Illawarra Line following a fatality at Ashfield earlier today.

Rail Control staff are endeavouring to bring services back to normal timetable as quickly as possible. Delays of up to 20 minutes may be experienced.



Improving practice

Passenger information staff located in the RMC update the website information on incidents and delays. The website and telephone service are useful but the information:

- is not train specific, and delays to individual services may be quite different to the estimate provided
- may not be timely, accurate or complete due to communication breakdowns
- does not indicate the time passengers can expect to arrive at their destination.

Computerising signal control will help in time

The most significant improvement to the quality of passenger information will come from the installation of computerised signal control.

International practice

Some railways in Japan, Germany and Switzerland provide automatically real-time information to passengers.

As discussed in the previous chapter, RailCorp is in the process of developing a new Metropolitan Signal Control Strategy which should accelerate computerisation of signal control and provide electronic, real-time information on train stopping patterns, destinations and delays:

- to station staff, to enable them to provide accurate passenger information
- directly to passengers on stations through the SPI system visual displays and digital voice announcements
- to train guards, to enable them to provide accurate information to train passengers.



Improving practice

While waiting for computerisation of signal control, RailCorp has a number of projects to improve passenger information. These include:

- displaying messages from the CityRail website on large liquid crystal display (LCD) screens at the entrances to 24 major stations
- expanding the long-line public address system coverage to all stations by December 2005
- improving and extending SPI systems.

Exhibit 20: New LCD screens at station entrances



Recommendation

It is recommended that RailCorp

- during disruptions make use of the long-line public address system when it achieves full station coverage in December 2005
- investigate ways to provide more specific information on the website, as initiatives to reduce network complexity and improve communication are implemented.

4.3 Staff access to information

Staff on stations and trains don't always know what is happening

For passenger information to be correct, there is a need for station staff and train crews to know exactly what is happening.

As discussed in the previous chapter, communication between controllers, signallers, station staff, and train crews often breaks down during a disruption. As a result, station staff and train crews often do not receive sufficient, accurate, real-time information to pass on to passengers. Railway staff can also receive conflicting information from different sources which can be confusing.

Exhibit 21: Passenger information examples

Some examples of our observations of passenger information were:

- the SPI visual display screen and public address announcement indicated the train was all stations to Liverpool. Near Central, the guard announced that the train would terminate there and there was another train waiting on the opposite platform to complete the trip to Liverpool. However, there was no train waiting. The screen indicated the next train was not all stations to Liverpool, but an Airport line service. Five minutes later, a train pulled in but it was neither the Liverpool nor the Airport line service. Station staff then announced the all stations to Liverpool would arrive in ten minutes, which it did
- a Macarthur train was terminated at Campbelltown. Station staff made a very clear and precise announcement explaining the change, when the next train to Macarthur was due, the platform from which it would leave and how best to get to this platform. However, within two minutes it was announced that a bus to Macarthur had arrived and was waiting for the passengers at the entrance to the station
- the station attendant rang the signal box to find out if the stopping pattern of a late-running train would be changed. He announced it would not. As the train pulled out from the station, the guard announced the stopping pattern had been changed.

4.4 Variations between staff and locations

Variations between staff and locations occur, which can't be explained by differences in the quality of information they receive

We found that some staff, in some locations, inform passengers far better than others despite the limitations of current technology. For example, some announcers on City Circle platforms provide excellent communication. This is greatly appreciated by passengers. But the standard is not always consistent. Some, but not all, of this variation can be explained by differences in the quality of information which staff at stations or on trains receive.

We found that, even where railway staff receive information about changes to services, the timeliness, accuracy, and clarity of messages to passengers differs, depending on the station or train and who is on duty.

Demonstrates opportunity to improve without technology

This variation demonstrates potential for improvement in passenger service without changing technology. Addressing this variation, and ensuring that staff on stations and trains pass on the information available to them in a clear, accurate and timely manner, should be a focus for improvement while we are waiting for computerisation of signal control.



Improving practice

As discussed earlier, RailCorp has a number of projects underway to improve guidance, supervision and training of staff. For example, in the course of this audit RailCorp engaged a communications specialist to help improve announcements on stations. The specialist has suggested that all announcements should be about train running or passenger safety, and that other messages should be conveyed by signage. The next phase of the project is to provide staff with station-specific information about how best to inform passengers about train running. RailCorp advises that this will be piloted at Central station in June 2005.

Exhibit 22: Passenger information examples

Some examples of our observations of passenger information were:

- ✓ a station attendant stood near the indicator at Rockdale, telling passengers clearly and precisely when the next train was due to depart and the platform it would depart from
- ✗ the 'express train' from the city to Emu Plains travelled extremely slowly, frequently stopped and finally reached Parramatta after 70 minutes (40 minutes late). The guard did not make any announcement about the extent of the delay or the reason, or apologise to passengers. It was a very hot summer's day, the train was overcrowded and not air conditioned, and it stopped frequently at stations but the doors were not opened to allow passengers to alight to make alternate arrangements
- ✓ CityRail recently discontinued direct services between the CBD and the Southern Highlands. Passengers now have to change at Campbelltown. There is a designated connecting service for each evening train. If passengers do not catch the designated train, they can miss their connection and have to wait hours for the next. When services were disrupted, one staff member at Wynyard consistently provided better information than others, and the information provided at Central was consistently clearer and more accurate than that provided at most City Circle stations. Some passengers now catch the first available train to Central to get better information
- ✓ the announcement at the station directed the train crew not to depart until the connecting service arrived
- ✗ the indicator showed the train would stop at Rockdale and Kogarah, which was confirmed by a station announcement. It skipped these and went to Hurstville. There was no announcement on the train. Affected passengers changed to the middle platform for the train back. After about 20 minutes, it was announced that the return train had been cancelled. Ten minutes later it was announced that the next train to Kogarah and Rockdale would arrive on another platform
- ✓ the guard on the inter-city train made very clear, accurate and detailed announcements about the carriages passengers needed to be in to alight at upcoming 'short' platforms.



Improving practice

RailCorp is in the process of designing and implementing a performance measurement and reporting framework to measure and report organisational, group and individual performance. A key aim is to improve the transparency of reporting and accountability for performance across the organisation.

This Corporate Performance Measurement Framework started with RailCorp adopting seventeen corporate key performance indicators, and cascading them into senior staff performance agreements and business unit plans. It is now developing performance measures and internal reporting processes for operational levels. Stations are a priority focus for this project.

Valid measurement of individual and station performance in providing information to passengers would allow RailCorp to better:

- hold staff accountable for providing clear, accurate and timely information
- instil a 'passenger-service' mind-set amongst staff
- recognise and reward consistently good passenger service.

Recommendation

It is recommended that RailCorp:

- ensure that communicating clear, accurate and timely information to passengers during a disruption is a core accountability in RailCorp staff performance statements
- establish a suite of measures of group and individual performance in providing clear, accurate and timely information to passengers
- require station management to make regular on-platform checks of the quality of information.

Appendices

Appendix 1 About the audit

Audit objective	The objective of this audit was to examine and report on how well RailCorp, when there is a disruption to scheduled operations, manages passenger journeys and provides information to passengers to help them understand what is happening and make decisions.
Audit scope	<p>The audit focused on:</p> <ul style="list-style-type: none">▪ unplanned 'routine' disruptions▪ the CityRail greater metropolitan network▪ 'peak' passenger services. <p>The audit did not examine:</p> <ul style="list-style-type: none">▪ planned disruptions, such as track possessions▪ prevention of incidents▪ rectification of incidents eg the repair of points or signals▪ high impact disruptions arising from low-frequency, emergency incidents eg the Waterfall derailment and the Town Hall gas leak▪ the merit of government policy objectives. <p>In undertaking the audit, we assessed RailCorp's response to disruptions from the perspective of a passenger.</p>
Audit criteria	<p>The audit reviewed whether, when there are routine disruptions to scheduled peak passenger services, RailCorp:</p> <ul style="list-style-type: none">▪ manages changes to journeys to minimise the adverse impact on passengers▪ provides passengers the information they need to minimise adverse impacts.
Audit approach	<p>The audit acquired subject matter expertise through:</p> <ul style="list-style-type: none">▪ interviews with relevant RailCorp staff, the Ministry of Transport, the Independent Transport Safety and Reliability Regulator, NSW Treasury, and the Independent Pricing and Regulatory Tribunal▪ review of relevant documents▪ research into practices elsewhere. <p>In addition, we contracted Binary Consultants Pty Ltd to provide expert advice and contribute to the development of the audit report.</p>
Acknowledgements	The Audit Office would like to thank all those in RailCorp who contributed to our understanding of how it copes with disruptions and its improvement plans. In particular, we appreciated the significant effort of Mr Ron Creighton and Ms Carmen Morrison to arrange our site visits, meetings with key staff, and access to documents, as well as providing guidance in the course of the audit. We also acknowledge the expert support of our consultant, Rolf Bergmaier.
Audit team	Our team leader for this performance audit was Rod Longford, who was assisted by Bettina Ocias. Jane Tebbatt provided direction and quality assurance.
Cost	Including printing and all overheads the estimated cost of the audit is \$282,000.

Appendix 2	Glossary
CityRail	RailCorp's 'brand name' for metropolitan passenger train services
dwelt time	The period during which a train is stopped at a station to allow for passengers to get off and board the train
GRMLs	Group Remote Monitoring Locations are manned 24/7, monitor closed circuit television cameras and respond to any emergency help point calls which occur. They can utilise long-line public address systems to make announcements to stations that have long-line public address capacity. There are 17 GRMLs
ITSRR	Independent Transport Safety and Reliability Regulator, a statutory authority responsible for strategic coordination of safety regulation, investigating and reporting on accidents involving transport services, accrediting operators of railways, and reviewing and evaluating issues relating to the reliability of publicly funded transport services
LCD screen	Liquid Crystal Display screen used at Sydney CBD stations to display messages for passengers
peak periods	The busiest periods of the day. RailCorp defines the weekday morning peak as trains arriving at Central station between 6 am and 9 am, and the weekday afternoon peak as trains departing Central between 4 pm and 6 pm
points	Movable rails that allow a train to change routes
Rail Clearways	Fifteen major infrastructure projects that will separate the network's 14 metropolitan rail routes into five largely independent clearways
RMC	Rail Management Centre, a division in RailCorp which manages the day-to-day operation of train services on the network
rolling stock	A term for a group of rail wagons of various types, including locomotives and freight wagons and passenger cars
routine disruptions	Disruptions to train services which arise from insufficient train crews, signal failures, poor weather, vandalism, passenger illness and the like
sectorisation	Separation of the rail network into independent sectors
signal box	A place from where points, signals, interlocking apparatus or signal control panels are operated
signaller	A qualified person who has control over points, signals and other signalling equipment to manage routes for transit of rail traffic
skipping stations	Bypassing scheduled stops (changing or altering a train stopping pattern)

SPI system	Station Passenger Information system comprises visual display screens and digital voice announcements
TLS	Train Locator System which provides information on the position of trains on the network with their identification numbers
train controller	A qualified person who manages train paths to ensure safe and efficient transit of rail traffic
train crew	Train driver and train guard in charge of the operation of trains
train crossing loops	A length of track connected to the main line by switches at both ends to provide a facility that permits trains to both cross and pass each other
transposition	An intervention by a train controller which includes cancellation of a service, termination of a train, skipping stations, diverting trains, utilising a stand-by train set, and swapping stopping patterns between trains
turnback	A combination of points, crossings and guard rails which permit traffic to turnout from one track to another
'x' ring telephone	Party-line telephone system used in RailCorp to communicate between stations and signal boxes

Performance audits by the Audit Office of New South Wales

Performance Auditing

What are performance audits?

Performance audits are reviews designed to determine how efficiently and effectively an agency is carrying out its functions.

Performance audits may review a government program, all or part of a government agency or consider particular issues which affect the whole public sector.

Where appropriate, performance audits make recommendations for improvements relating to those functions.

Why do we conduct performance audits?

Performance audits provide independent assurance to Parliament and the public that government funds are being spent efficiently and effectively, and in accordance with the law.

They seek to improve the efficiency and effectiveness of government agencies and ensure that the community receives value for money from government services.

Performance audits also assist the accountability process by holding agencies accountable for their performance.

What is the legislative basis for Performance Audits?

The legislative basis for performance audits is contained within the *Public Finance and Audit Act 1983, Part 3 Division 2A*, (the Act) which differentiates such work from the Office's financial statements audit function.

Performance audits are not entitled to question the merits of policy objectives of the Government.

Who conducts performance audits?

Performance audits are conducted by specialist performance auditors who are drawn from a wide range of professional disciplines.

How do we choose our topics?

Topics for performance audits are chosen from a variety of sources including:

- our own research on emerging issues
- suggestions from Parliamentarians, agency Chief Executive Officers (CEO) and members of the public
- complaints about waste of public money
- referrals from Parliament.

Each potential audit topic is considered and evaluated in terms of possible benefits including cost savings, impact and improvements in public administration.

The Audit Office has no jurisdiction over local government and cannot review issues relating to council activities.

If you wish to find out what performance audits are currently in progress just visit our website at www.audit.nsw.gov.au.

How do we conduct performance audits?

Performance audits are conducted in compliance with relevant Australian standards for performance auditing and operate under a quality management system certified under international quality standard ISO 9001.

Our policy is to conduct these audits on a "no surprise" basis.

Operational managers, and where necessary executive officers, are informed of the progress with the audit on a continuous basis.

What are the phases in performance auditing?

Performance audits have three key phases: planning, field work and report writing.

During the planning phase, the audit team will develop audit criteria and define the audit field work.

At the completion of field work an exit interview is held with agency management to discuss all significant matters arising out of the audit. The basis for the exit interview is generally a draft performance audit report.

The exit interview serves to ensure that facts presented in the report are accurate and that recommendations are appropriate. Following the exit interview, a formal draft report is provided to the CEO for comment. The relevant Minister is also provided with a copy of the draft report. The final report, which is tabled in Parliament, includes any comment made by the CEO on the conclusion and the recommendations of the audit.

Depending on the scope of an audit, performance audits can take from several months to a year to complete.

Copies of our performance audit reports can be obtained from our website or by contacting our publications unit.

How do we measure an agency's performance?

During the planning stage of an audit the team develops the audit criteria. These are standards of performance against which an agency is assessed. Criteria may be based on government targets or benchmarks, comparative data, published guidelines, agencies' corporate objectives or examples of best practice.

Performance audits look at:

- processes
- results
- costs
- due process and accountability.

Do we check to see if recommendations have been implemented?

Every few years we conduct a follow-up audit of past performance audit reports. These follow-up audits look at the extent to which recommendations have been implemented and whether problems have been addressed.

The Public Accounts Committee (PAC) may also conduct reviews or hold inquiries into matters raised in performance audit reports. Agencies are also required to report actions taken against each recommendation in their annual report.

To assist agencies to monitor and report on the implementation of recommendations, the Audit Office has prepared a Guide for that purpose. The Guide, *Monitoring and Reporting on Performance Audits Recommendations*, is on the Internet at <www.audit.nsw.gov.au/guides-bp/bpqlist.htm>

Who audits the auditors?

Our performance audits are subject to internal and external quality reviews against relevant Australian and international standards. This includes ongoing independent certification of our ISO 9001 quality management system.

The PAC is also responsible for overseeing the activities of the Audit Office and conducts reviews of our operations every three years.

Who pays for performance audits?

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

For further information relating to performance auditing contact:

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email: stephen.horne@audit.nsw.gov.au

Performance Audit Reports

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
65	Attorney General's Department	<i>Management of Court Waiting Times</i>	3 September 1999
66	Office of the Protective Commissioner Office of the Public Guardian	<i>Complaints and Review Processes</i>	28 September 1999
67	University of Western Sydney	<i>Administrative Arrangements</i>	17 November 1999
68	NSW Police Service	<i>Enforcement of Street Parking</i>	24 November 1999
69	Roads and Traffic Authority of NSW	<i>Planning for Road Maintenance</i>	1 December 1999
70	NSW Police Service	<i>Staff Rostering, Tasking and Allocation</i>	31 January 2000
71*	Academics' Paid Outside Work	<i>Administrative Procedures Protection of Intellectual Property Minimum Standard Checklists Better Practice Examples</i>	7 February 2000
72	Hospital Emergency Departments	<i>Delivering Services to Patients</i>	15 March 2000
73	Department of Education and Training	<i>Using Computers in Schools for Teaching and Learning</i>	7 June 2000
74	Ageing and Disability Department	<i>Group Homes for People with Disabilities in NSW</i>	27 June 2000
75	NSW Department of Transport	<i>Management of Road Passenger Transport Regulation</i>	6 September 2000
76	Judging Performance from Annual Reports	<i>Review of Eight Agencies' Annual Reports</i>	29 November 2000
77*	Reporting Performance	<i>Better Practice Guide A guide to preparing performance information for annual reports</i>	29 November 2000
78	State Rail Authority (CityRail) State Transit Authority	<i>Fare Evasion on Public Transport</i>	6 December 2000
79	TAFE NSW	<i>Review of Administration</i>	6 February 2001
80	Ambulance Service of New South Wales	<i>Readiness to Respond</i>	7 March 2001
81	Department of Housing	<i>Maintenance of Public Housing</i>	11 April 2001
82	Environment Protection Authority	<i>Controlling and Reducing Pollution from Industry</i>	18 April 2001
83	Department of Corrective Services	<i>NSW Correctional Industries</i>	13 June 2001
84	Follow-up of Performance Audits	<i>Police Response to Calls for Assistance The Levying and Collection of Land Tax Coordination of Bushfire Fighting Activities</i>	20 June 2001
85*	Internal Financial Reporting	<i>Internal Financial Reporting including a Better Practice Guide</i>	27 June 2001

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
86	Follow-up of Performance Audits	<i>The School Accountability and Improvement Model (May 1999)</i> <i>The Management of Court Waiting Times (September 1999)</i>	14 September 2001
87	E-government	<i>Use of the Internet and Related Technologies to Improve Public Sector Performance</i>	19 September 2001
88*	E-government	<i>e-ready, e-steady, e-government: e-government readiness assessment guide</i>	19 September 2001
89	Intellectual Property	<i>Management of Intellectual Property</i>	17 October 2001
90*	Intellectual Property	<i>Better Practice Guide</i> <i>Management of Intellectual Property</i>	17 October 2001
91	University of New South Wales	<i>Educational Testing Centre</i>	21 November 2001
92	Department of Urban Affairs and Planning	<i>Environmental Impact Assessment of Major Projects</i>	28 November 2001
93	Department of Information Technology and Management	<i>Government Property Register</i>	31 January 2002
94	State Debt Recovery Office	<i>Collecting Outstanding Fines and Penalties</i>	17 April 2002
95	Roads and Traffic Authority	<i>Managing Environmental Issues</i>	29 April 2002
96	NSW Agriculture	<i>Managing Animal Disease Emergencies</i>	8 May 2002
97	State Transit Authority Department of Transport	<i>Bus Maintenance and Bus Contracts</i>	29 May 2002
98	Risk Management	<i>Managing Risk in the NSW Public Sector</i>	19 June 2002
99	E-Government	<i>User-friendliness of Websites</i>	26 June 2002
100	NSW Police Department of Corrective Services	<i>Managing Sick Leave</i>	23 July 2002
101	Department of Land and Water Conservation	<i>Regulating the Clearing of Native Vegetation</i>	20 August 2002
102	E-government	<i>Electronic Procurement of Hospital Supplies</i>	25 September 2002
103	NSW Public Sector	<i>Outsourcing Information Technology</i>	23 October 2002
104	Ministry for the Arts Department of Community Services Department of Sport and Recreation	<i>Managing Grants</i>	4 December 2002
105	Department of Health Including Area Health Services and Hospitals	<i>Managing Hospital Waste</i>	10 December 2002
106	State Rail Authority	<i>CityRail Passenger Security</i>	12 February 2003
107	NSW Agriculture	<i>Implementing the Ovine Johne's Disease Program</i>	26 February 2003

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
108	Department of Sustainable Natural Resources Environment Protection Authority	<i>Protecting Our Rivers</i>	7 May 2003
109	Department of Education and Training	<i>Managing Teacher Performance</i>	14 May 2003
110	NSW Police	<i>The Police Assistance Line</i>	5 June 2003
111	E-Government	<i>Roads and Traffic Authority Delivering Services Online</i>	11 June 2003
112	State Rail Authority	<i>The Millennium Train Project</i>	17 June 2003
113	Sydney Water Corporation	<i>Northside Storage Tunnel Project</i>	24 July 2003
114	Ministry of Transport Premier's Department Department of Education and Training	<i>Freedom of Information</i>	28 August 2003
115	NSW Police NSW Roads and Traffic Authority	<i>Dealing with Unlicensed and Unregistered Driving</i>	4 September 2003
116	NSW Department of Health	<i>Waiting Times for Elective Surgery in Public Hospitals</i>	18 September 2003
117	Follow-up of Performance Audits	<i>Complaints and Review Processes (September 1999) Provision of Industry Assistance (December 1998)</i>	24 September 2003
118	Judging Performance from Annual Reports	<i>Review of Eight Agencies' Annual Reports</i>	1 October 2003
119	Asset Disposal	<i>Disposal of Sydney Harbour Foreshore Land</i>	26 November 2003
120	Follow-up of Performance Audits NSW Police	<i>Enforcement of Street Parking (1999) Staff Rostering, Tasking and Allocation (2000)</i>	10 December 2003
121	Department of Health NSW Ambulance Service	<i>Code Red: Hospital Emergency Departments</i>	15 December 2003
122	Follow-up of Performance Audit	<i>Controlling and Reducing Pollution from Industry (April 2001)</i>	12 May 2004
123	National Parks and Wildlife Service	<i>Managing Natural and Cultural Heritage in Parks and Reserves</i>	16 June 2004
124	Fleet Management	<i>Meeting Business Needs</i>	30 June 2004
125	Department of Health NSW Ambulance Service	<i>Transporting and Treating Emergency Patients</i>	28 July 2004
126	Department of Education and Training	<i>School Annual Reports</i>	15 September 2004
127	Department of Ageing, Disability and Home Care	<i>Home Care Service</i>	13 October 2004
128*	Department of Commerce	<i>Shared Corporate Services: Realising the Benefit including guidance on better practice</i>	3 November 2004
129	Follow-up of Performance Audit	<i>Environmental Impact Assessment of Major Projects (2001)</i>	1 February 2005

No	Agency or Issues Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
130*	Fraud Control	<i>Current Progress and Future Directions including guidance on better practice</i>	9 February 2005
131	Follow-up of Performance Audit Department of Housing	<i>Maintenance of Public Housing (2001)</i>	2 March 2005
132	Follow-up of Performance Audit State Debt Recovery Office	<i>Collecting Outstanding Fines and Penalties (2002)</i>	17 March 2005
133	Follow-up of Performance Audit Premier's Department	<i>Management of Intellectual Property (2001)</i>	30 March 2005
134	Department of Environment and Conservation	<i>Managing Air Quality</i>	6 April 2005
135	Department of Infrastructure, Planning and Natural Resources Sydney Water Corporation Sydney Catchment Authority	<i>Planning for Sydney's Water Needs</i>	4 May 2005
136	Department of Health	<i>Emergency Mental Health Services</i>	26 May 2005
137	Department of Community Services	<i>Helpline</i>	1 June 2005
138	Follow-up of Performance Audit State Transit Authority Ministry of Transport	<i>Bus Maintenance and Bus Contracts (2002)</i>	14 June 2005
139	RailCorp NSW	<i>Managing disruptions to CityRail passenger services</i>	June 2005

* Better Practice Guides

Performance Audits on our website

A list of performance audits tabled or published since March 1997, as well as those currently in progress, can be found on our website <www.audit.nsw.gov.au>

If you have any problems accessing these Reports, or are seeking older Reports, please contact our Executive Officer on 9275 7220.