

AUDITOR-GENERAL'S REPORT

PERFORMANCE AUDIT

State Rail Authority

The Millennium Train Project

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Foreword

Large asset acquisitions – whether through construction or purchase – can involve complex issues and significant risks that need to be carefully managed.

While this audit focuses on the Millennium Train, it has significant broader messages and implications.

The Audit Office previously audited aspects of the last such rail acquisition, the Tangara. I wanted to see if lessons had been learnt from the Tangara contract and if the Millennium Train procurement was well handled. I also wanted to address the complex issue of value-for-money from such a large acquisition.

Each 4-car Millennium Train set has an estimated service operating life of 35 years. If all purchase and maintenance options under the Millennium Train supply contract are exercised, a billion dollars of capital and operating funds will be expended over four decades.

A project of this magnitude provides an ideal case study. The findings of this audit are not only relevant to StateRail, but provide useful insights for all those involved with managing major projects and those with interests in such matters.

The audit also highlights how decisions in one area may be linked to broader issues. This is especially true of public infrastructure. Value-for-money needs to be assessed in the context of the overall system, not only for individual acquisitions. This requires longer-term thinking and planning.

This report shows how the constraints imposed by Sydney's current rail infrastructure impact on achieving best value when buying new rolling stock. The report highlights the significant issues and challenges that need to be addressed in providing rail public transport in Sydney in the 21st century.

R J Sendt
Auditor-General

June 2003

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Executive Summary

Executive summary

Background

On 8 October 1998 the State Rail Authority of New South Wales (StateRail) signed a contract for the design, build and 15 years maintenance of 81 new suburban double deck electric passenger cars. These are now known as the Millennium Train.

On 5 December 2002 StateRail formally committed to Stage 2 of the Contract: another 60 cars and 15 years maintenance. If Stage 3 of the contract is taken up along with all maintenance options StateRail will expend approximately \$1 billion in capital and operating funds over about four decades.

The first 4 car Millennium Train set entered into revenue service on the Sydney suburban rail network on 1 July 2002. As at 10 April 2003 11 of the 20 sets of 4 cars under Stage 1 of the Contract had been delivered and entered into service on the network. It is expected that one 4 car set will be delivered each month.

The Audit

Purchasing new trains is a huge, expensive and complex task. We had previously reported on aspects of the last such major purchase: the Tangara.

The Millennium Train represents a substantial enhancement of the quality of the CityRail fleet of Sydney electric suburban passenger trains. There are still some teething problems, and the train was withdrawn from service on 10 April 2003 until 1 June 2003, seven weeks approximately, to undertake further testing. Even so, much about the Millennium Train is impressive, although time will be needed to tell about its performance.

The net overall increase in the suburban fleet size from the Millennium Train purchase is 145 cars or 12.7 per cent (1 car is a collision spare). This is because the purchase of the 200 Millennium Train cars will allow the retirement of the 56 oldest cars, the Tullochs. It will also enable 6 car trains to be increased to 8 car trains and provide additional trains needed to service the Parramatta Rail Link.

In this audit we sought to consider both macro and micro issues. We looked at the complex issue of value for money. We also looked at how well the project was managed and if lessons learnt from the Tangara had been put into practice.

Audit opinion

StateRail has made significant improvements since the purchase of the Tangara. It improved measures necessary for handling contracts dealing with technically complex and innovative projects, although some other problems have been encountered, with new lessons to learn.

The design and manufacture of new trains requires a significant investment in both time and cost. The Millennium Train has come at a considerably higher price than originally expected. And it is very late compared to the Government's original announcements, as the development/design took longer than planned.

Since the Millennium Train contract was awarded in 1998 and the budget set:

- **contract (capital) costs have increased by \$114 million or 24 per cent to \$588 million**
- **total project costs have increased by \$98.4 million or 17 per cent to \$658 million.**

Value for money is always a contentious point. And the judgement of it can depend on the prevailing conditions and constraints. If judged within the existing operational environment, and the constraints imposed by the existing rail network, evidence supports a view that the purchase represents reasonable value for money.

But large long-life purchases should be examined from the perspectives of both the existing constraints and the long-term.

There are clear signs that parts of Sydney's transport system are rapidly approaching, if not having already reached, saturation point. And if that is the case, it is now time to reconsider whether the existing service operating and infrastructure arrangements will continue to serve us well into the future.

Future decisions to purchase new trains, and the type of train and purchasing arrangements favoured, may have better value for money options available for consideration if current operating and infrastructure constraints are altered.

Our report urges that a broader and longer-term framework be made available and examined in the procurement of transport infrastructure. We, however, also point to some important issues for improvement in future acquisition processes under the existing arrangements.

Key Findings

We found that:

- the current service objectives, operating strategies and rail infrastructure (the vertical, lateral, horizontal and weight limitations of the lines over which services traverse) impose key requirements/limitations when considering options for purchasing new rollingstock. These requirements/limitations and any proposed changes must be considered in totality to ensure that sub optimal trade offs do not occur
- there are capacity problems emerging with the rail system/network. The wide recognition given to these problems flowing from the 2001 “Christie Report”, as well as a series of highly publicised problems in recent times, provides an opportunity to correct the underlying causes and make fundamental/revolutionary as opposed to incremental changes to the existing rail network
- the traditional procurement method of competitive tendering and contracting may give rise to risks of a monopoly market being created in the Australian passenger rollingstock industry
- important elements of corporate governance were not always optimal. For example, key decision makers (the StateRail Board and/or the then Minister for Transport) were:
 - ⇒ advised of a potential “risk premium” for the maintenance being outsourced to the train manufacturer/supplier in exchange for enhanced performance and to maintain the enhanced features in the train. But this was not quantified at the time the decision was taken. Current StateRail estimates indicate that maintenance costs will be less than the remainder of the electric fleet for the same levels of availability and reliability
 - ⇒ not specifically advised that as the estimated and tendered costs for the project were sufficiently similar a further review of value for money was not needed
 - ⇒ not given a risk management plan for the Millennium Train

- ⇒ not timely in approving the tendering for the Millennium Train (it took 17 months). Accordingly the purchase timetable was aggressive and created expectations which were not met, although the Contract never planned for the delivery of the train prior to the 2000 Sydney Olympics
- ⇒ not providing and directing sufficient internal audit resources on this project, a repeat of the situation that occurred with the Tangara
- because governments cannot readily walk away from such projects, even if difficulties arise, they necessarily carry significant risk for such projects. Contract provisions designed to share risk with private sector providers thus need to be robust and enforceable should the need arise. But as occurred with the Tangara, such financial penalties for late delivery were available but were not activated. This was because the contract was in dispute over time and cost issues
- the 'payment upon delivery' approach for this contract did apparently manage product risks. However, in turn it also created other risk exposures for StateRail
- the 409 days delay in the Millennium Train's progressive delivery and entry into service caused discomfort and lack of service quality to passengers, particularly during peak periods on some lines
- StateRail's specification of the Millennium Train represented a significant improvement on the Tangara but was still not as performance based a contract as would be preferred. StateRail advised that:
 - ⇒ a constraining factor is the readiness and ability of the Australian rail industry to move further along the contract continuum
 - ⇒ the specification was forwarded for rail industry comment but the level of feedback was not comprehensive nor extensive.
- the restructure of the New South Wales rail authorities in 1996 and a disruptive purchase environment at StateRail had some effect on the Millennium Train project

Summary of recommendations

It is recommended that the Department of Urban and Transport Planning should:

- **in coordination with rail entities compile as a matter of priority a long term (meaning at least a 20-30 year horizon) strategic plan for the Sydney rail network.**

It is recommended that the Transport Co-ordination Authority should:

- **require StateRail to expand the level of public reporting of the outcomes and results achieved against the CityRail (Community) Service Agreement in order to increase accountability, transparency and openness about the rail network's performance.**

It is recommended that StateRail should:

- **explore the various purchasing options available for obtaining new trains and identify which option gives the best value for money**
- **continue to assess the benefits and risks of its train maintenance arrangements to ascertain with greater confidence which arrangements provide the best value for money**
- **further review the level of specification in performance based contracts occurring in train purchase tenders and contracts (an issue also with the Tangara)**
- **ensure that the performance standards specified in contracts are appropriate (an issue also with the Tangara)**
- **review the adequacy of liquidated damages included in contracts and specify more clearly how and when liquidated damages will be applied in the event of the contractor failing to perform as specified**
- **involve internal audit at crucial stages in major projects and in on-going risk management reviews (an issue also with the Tangara)**
- **have a standard escrow arrangement for relevant intellectual property owned by the contractor included in all future major contracts**

- **further avoid potential for perceived conflicts of interest in the use of probity advisers by limiting the use of the same advisers in other review work on the same project**
- **more carefully assess the options for responding to risks as contractual provisions do not necessarily avoid and/or mitigate risk events to StateRail's business objectives**
- **be mindful of reputation risks that marketing and communications can create with the public (passengers) and StateRail employees.**

Response from Agencies

Refer to Appendix 5 for agency responses to the report and StateRail Authority's response to the recommendations.

1. Background

1.1 About CityRail

CityRail and StateRail CityRail is StateRail's (the State Rail Authority of NSW) operator of passenger rail service covering the greater Sydney region. StateRail's principal objective is to deliver safe, reliable railway passenger services in NSW in an efficient, effective and financially responsible manner.¹

CityRail's Service Commitments CityRail has publicly committed to providing safe, clean, accessible, reliable and punctual passenger train services.² The services CityRail provides comprise suburban, intercity and some regional passenger/commuter trains in the Sydney, Hunter Valley, Central Coast, Blue Mountains, Southern Highlands and South Coast areas.

CityRail Fleet at 30 June 2002 CityRail had a fleet (rollingstock) of 1,502 passenger train cars (carriages) in use at 30 June 2002. This fleet comprised four generic categories of trains, see Exhibit 1 below.

Exhibit 1: CityRail's Fleet Generic Categories as at 30 June 2002		
Generic Category	Area of Operation	Fleet No. as at 30 June 2002
Suburban – Double Deck Electric	Berowra in the north, Emu Plains and Richmond in the west and Macarthur and Waterfall in the south	1,138
Outer Suburban - Double Deck Electric	Wyong in the north, Springwood in the west and Wollongong/Kiama in the south	80
Intercity - Double Deck Electric	Newcastle in the north, Lithgow in the west and Kiama in the south to Central where service terminates	240
Regional - Single Deck Diesel	Goulburn to Campbelltown and Nowra to Kiama where service terminates although some services go through to Central and Wollongong respectively where service terminates Dungog and Scone to Newcastle where service terminates	44
Total Rollingstock		1,502

Source: StateRail Records

The fleet had a gross (undepreciated) value/cost of roundly \$4.0 billion.

¹ Transport Administration Act 1988 section 4A (1)

² CityRail Website Service Commitment Pages as at 29 January 2003

CityRail Large Operator

This investment in rollingstock reflects CityRail being the largest rail service operator within Australia, see Exhibit 2 below.

Exhibit 2: CityRail's Operations Compared to that Occurring Nationally						
2001-02	QLD	SA	VIC	WA	NSW	Total
Millions of Passenger Journeys	47	8	134	30	276	495
Number of Stations	142	84	288	57	306	877
Number of Services Each Weekday (Monday to Friday)	740	242	2,061	750	3,000	6,793
Fleet – Electric & Diesel Cars	443	100	1,108	96	1,502	3,249

Source: Agency 2001-02 Annual Reports and/or Website Pages

1.2 Purchase of a New Suburban Train

Acquisition Genesis

The purchase by CityRail of a new suburban electric passenger train had its genesis in 1995 when the (then):

- Group General Manager CityRail approved development work commencing of the Fourth Generation Train
- Minister for Transport announced that the development of the Fourth Generation Train was underway.

StateRail Board and Ministerial Approvals

The StateRail Board and the then Minister for Transport approved in February and May 1997 respectively the acquisition of a new suburban electric passenger train. The Board set a budget of \$212 million (1995-96 dollars).

Pre-registration to Tender

Three train supply companies responded by the closing date of 13 June 1997 to the 'pre-registration to tender' request published in major Australian newspapers:

- ABB Daimler Benz Transportation (Australia) Limited (trading as Adtranz)
- a joint venture between GEC Alstom and Clyde Industries Limited (trading as Clyde Engineering)
- A Goninan & Company Limited.

Tenders Called and Received

On 22 July 1997 these companies were requested to submit tenders for the design, build and possible maintenance of the Fourth Generation Train. Three tender offers were received at the closing date of 5 November 1997.

Execution of Contract The then Minister for Transport and Evans Deakin Industries Limited (EDIL), whose subsidiary was EDI Rail, trading as Clyde Engineering, signed on 8 October 1998 the Deed of Agreement (the Contract) for the design, build and maintenance, for an initial period of 15 years, of 81 double deck electric cars. This was Stage 1 of the Contract.

The value of the Contract Stage 1 (design, build and maintain for 15 years only) was estimated to be \$323 million (1997/98 dollars). However, if all further purchase (an additional 120 cars) and maintenance (for 35 years) options are taken up then the contract is worth approximately \$1 billion.

StateRail gave a formal commitment to Stage 2 (another 60 cars) of the Contract on 5 December 2002. On 17 March 2003 the then Minister for Transport announced in effect that StateRail would proceed with the Stage 3 purchase option (another 60 cars) of the Contract.

Train Naming The then Chief Executive of StateRail on 22 April 1999 advised the project's steering committee that the new train was to be known as 'the Millennium Train'. Previous public advising on when the new train was expected to enter into service had seen it nicknamed 'The Olympian'. However, the Contract never intended for such a delivery timetable.

Entry into Revenue Service On 1 July 2002 the first non-peak hour revenue service of a 4 car Millennium Train set occurred. The first non-peak hour and peak hour revenue services of a 8 car Millennium Train set occurred respectively on 30 November 2002 and 4 December 2002.



Source: StateRail

**Detailed Key Events
Chronology**

Appendix 2 gives a more detailed chronology of key events, from June 1995 to 10 April 2003, with the Millennium Train purchase/project.

1.3 Previous New Train Purchase Review by the Audit Office

On 19 November 1996 we released a report, number 31, *State Rail Authority: Tangara Contract Finalisation*.

We noted in the report that:

The Tangara Project was one of Australia's largest ever railway rollingstock projects. The contract was successful in delivering the train cars significantly within budget and within the agreed delivery schedule ... despite ... being ... long in duration, large in cost ... and technically complex involving innovative technology.

and

The Tangara contract was characterised by a formal mediation, a series of reviews relating to project management, contract administration and engineering issues, and a finalisation review conducted by a specially designated committee. The use of these processes has highlighted the need for effective measures to handle complex contracts dealing with technically innovative projects.

The majority of our report was concerned with lessons for the future management of major projects.

Appendix 4 contains our assessment of how those matters have been dealt with in this project.

2. Strategic Issues and Challenges

2.1 Introduction

When examining large asset purchases such as this, a key question for which the community rightly expects an answer is ‘*did we get value for money from the purchase?*’

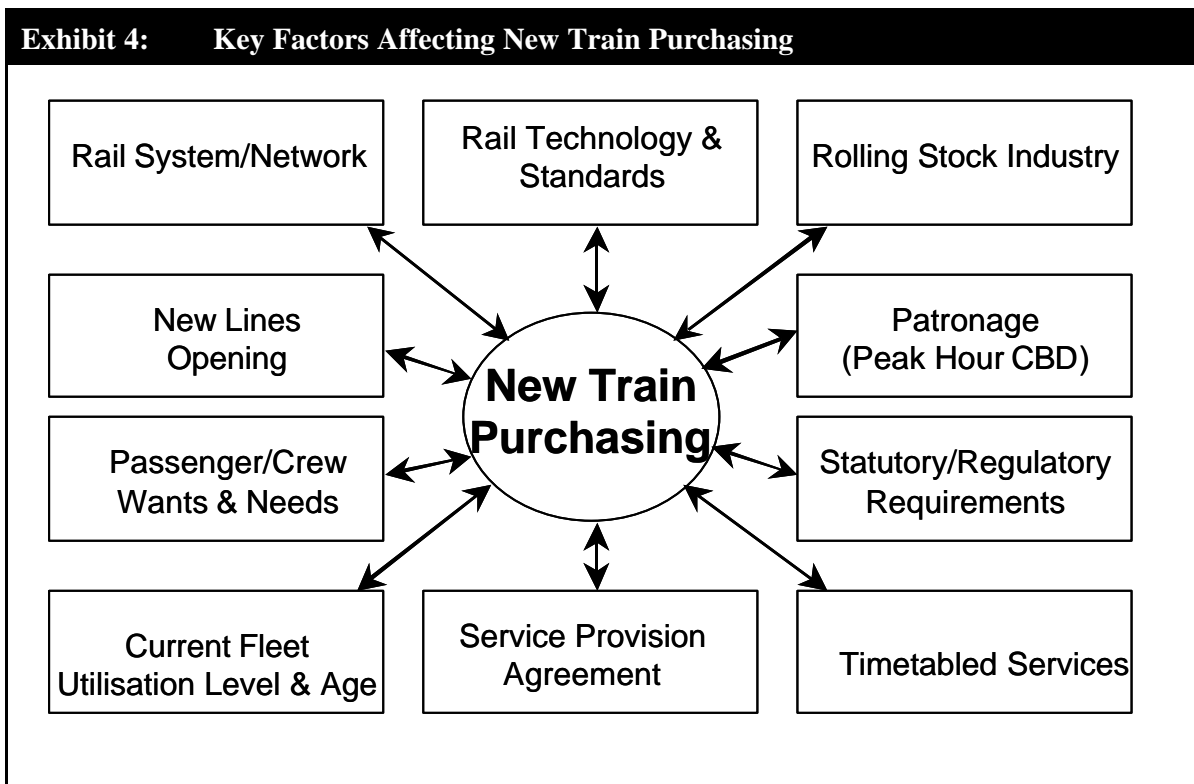
This simple question has complex dimensions depending on the context in which value for money is defined. The 2001-02 StateRail Annual Report advised that:

It is one of the most complex passenger rail operations in the world.

We examine relevant key issues in this chapter.

2.2 Infrastructure and Purchasing

Some of the main factors that affect the purchasing of new rollingstock, be it for fleet additions and/or replacements, are set out below.



It is apparent that a complex array of issues is involved in making a decision about such a purchase.

The extent to which options are limited may in turn restrict the value for money possibilities. We acknowledge that it is rare to have all options available, owing to circumstances or history. However, the broadest possible range of options should be considered.

The existing network limits purchasing options

In considering the purchase of new rollingstock there were a number of key requirements/limitations:

- the Sydney suburban rail network has grown considerably in the one and half centuries since the first rail line opened in 1855. As the network grew, variations occurred in infrastructure such as bridges, tunnels and station/platform configurations.

Consequently there are specific requirements for rollingstock used on Sydney's suburban rail lines. If a safe service is to be operated then the rollingstock must satisfy the most constrained part of the network, for example tightest curves, shortest platforms, lowest overpasses/tunnels

- when in the early 1960s it was decided to increase the passenger carrying capacity of the Sydney rail network, there was a switch to double deck trains. The first double deck trains entered service in 1964 and in 1992 the last of the single deck rollingstock was retired.

StateRail advised that the switch to double deck trains at the time was considered the most cost effective approach as it had minimal effect on the fixed infrastructure of stations, tunnels and signalling. Patronage and service timetabling levels make it difficult to revert to single deck trains in the current mode of operation

- the past and current land use patterns in Sydney have created a significant demand to transport commuters relatively long distances by rail.

These existing network requirements/limitations meant that the range of options considered was restricted as only certain solutions were viable. From the options considered, a decision was made to have a purpose built train with a new design for the Sydney suburban network. This carried with it a number of cost implications such as design and innovation risk, prototype and testing costs, and inability to benefit from cost savings available if 'off the shelf' designs and associated equipment/systems purchasing were possible.

If these network limitations are 'accepted' each time new rolling stock is to be acquired the result may be the most appropriate 'short-term' design but not the one that best meets long-term transport needs.

Changes to the network (that is eliminating or minimising the limitations) would mean that more options were available to purchase rollingstock. This could possibly lead to better value for money being obtained through purchasing new trains 'off the shelf' and/or standard trains.

The cost of the network changes required would be substantial and would need to be carefully assessed to ensure that the total cost of the network and rollingstock (including maintenance and operation costs for both) would achieve better value for money.

The capacity of the network is a problem

The current rail network has capacity problems³ on some lines during peak hour periods and the temporary solutions⁴ of incrementally increasing capacity will be very shortly, if not already, exhausted.

As noted by the Council on the Cost and Quality of Government in 1998,⁵ approximately 40 per cent of all rail commuter journeys start or end in the CBD. Currently 20 train movements in both directions is the maximum number that can occur during peak hour in the City Circle. The downside of double deck trains is that they have a longer 'dwell' time at stations, particularly in the CBD, because of the time it takes for passengers to load and unload. The Christie Report⁶ also advised that some stations in the CBD were unable to handle more passengers than they currently do.

The 2001-02 StateRail Annual Report advised that:

Almost 50% of all persons travelling to Sydney's Central Business District in peak hours travel on CityRail services.

³ Action for Transport 2010 - an Integrated Transport Plan for Sydney Page 3, Department of Transport, November 1998

⁴ Double deck trains and only trains in a 6 or 8 car set configuration are allowed to operate during peak hour on the suburban rail network

⁵ Transportation - Service Efforts and Accomplishments Report, Council on the Cost and Quality of Government, 1998

⁶ *Long Term Strategic Plan for Rail - Greater Sydney Metropolitan* Mr R Christie, former Acting Chief Executive of State Rail and Co-ordinator General of Rail, June 2001

The planning to resolve capacity is considered not adequate

There is a plan for improving the network's capacity, *Action for Transport 2010 – an Integrated Transport Plan for Sydney*. Actions have or are being undertaken to increase the current capacity of the network, for example:

- amplification of tracks on the East Hills and Richmond Lines
- Bondi Junction turnback (train turn around) which will increase capacity on the Illawarra line
- Parramatta rail link Stage 1 and 2 which will relieve congestion on the Main Western and Northern Lines.

However, this plan is a short term plan in infrastructure terms (which are often projected many years ahead). It does not address the full range of network (infrastructure) options available and continues to work within the current network limits.

The Christie Report makes it plain that the limitations of the current network have to be resolved. Further emphasis is given by a Rail Infrastructure Corporation (RIC) 2001 working paper:⁷

Based on current timetabling and infrastructure, the Sydney rail network has only a few years before capacity constraints become more problematic for the network as a whole, rather than just the CBD.

Given the magnitude of the task, and the dollars involved, a truly long term strategic plan for Sydney rail transport is essential. The Warren Centre has expressed similar sentiments.⁸ Currently there is no network plan beyond 2010.

This limits value for money considerations

In our view the value for money options available for the Millennium Train purchase and for future acquisitions are limited by the focus on short term infrastructure planning.

⁷ Sydney Passenger Forecasts - Working Paper 1, Rail Infrastructure Corporation, November 2001

⁸ The Warren Centre for Advanced Engineering, University of Sydney

The suburban rail network in Sydney is and will continue to be very busy. This is because effectively five railway services are operating using the same network:

- long distance (New South Wales regional and interstate) passenger service
- intercity passenger service (over 60 minutes)
- medium/middle distance passenger service (20-60 minutes)
- short distance passenger service (less than 20 minutes)
- freight haulage.

Excluding the City Circle and the Eastern Suburbs Line, the Sydney suburban network is not a metro railway like that found in major capital cities overseas.

The fact that the network is integrated to provide a wide range of service options makes it very difficult to introduce fundamental/revolutionary changes to the network or rollingstock.

The high density development and urban consolidation that is occurring in Sydney, particularly around railway stations, will place even greater demands on the capacity of the suburban network.

StateRail expects patronage to grow from 277 million in 2001-02 to between 370 to 396 million by 2021-22. However, *Action for Transport 2010* is contemplating even higher growth.

The Department of Urban and Transport Planning is currently drafting a document for setting out options and alternative views for increasing the network's capacity for consideration by stakeholders. Among these options is one involving the use of alternative 'metro-style' rollingstock on a proposed new rail line through the CBD.

An opportunity to make fundamental changes exists

There does seem to be an opportunity, given the Christie and Warren Reports and also recently highly publicised problems with the network infrastructure, to consider seriously fundamental/revolutionary changes as opposed to continuing with incremental changes to the rail network. Such an opportunity occurs rarely with infrastructure, and has major long-term implications for operational limits and costs.

A long term rail network plan, looking ahead some 20-30 years, would enable the major capital funds required to be planned for. It would also provide a valuable opportunity to change some of the existing factors that limit the value for money possibilities both for operations and for fleet additions and/or replacements.

2.3 Purchasing Process

Another significant component of value for money comes from the purchasing (procurement) process adopted.

StateRail has followed the traditional purchasing model of competitive tender and contract (CTC). This model assumes a competitive market place to ensure a fair and equitable price is paid for goods and services.

The market place for competition is limited

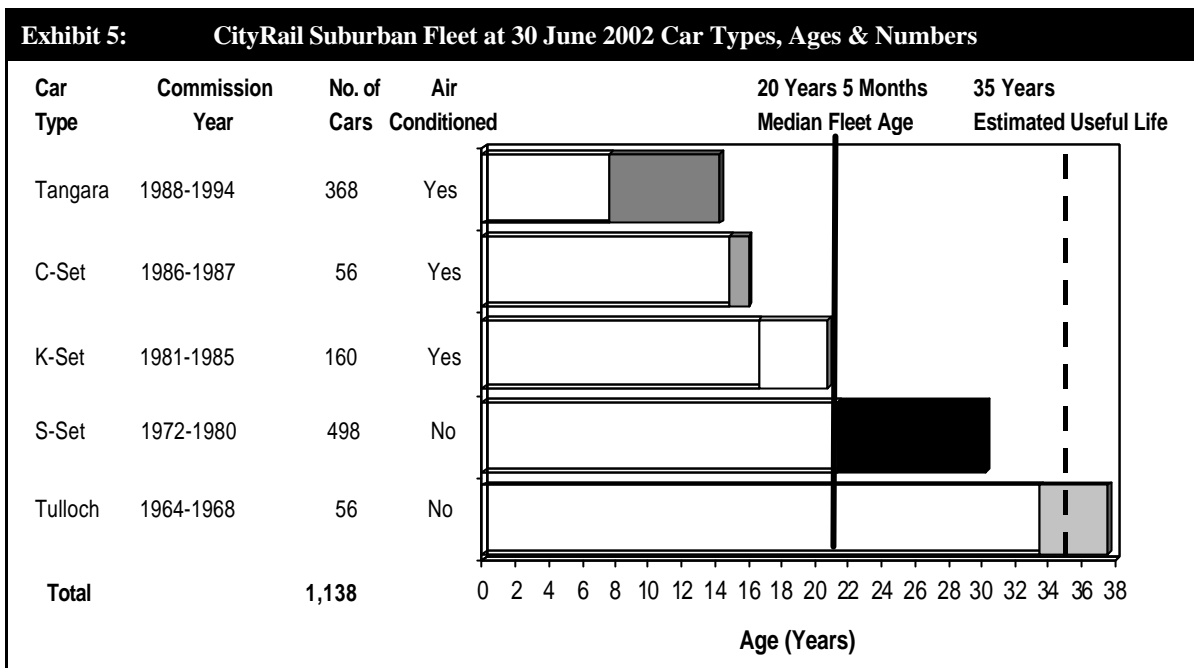
However, in Australia the market place for passenger rollingstock is small and there is a limited number of Australian suppliers. StateRail advised that the international rail industry is not interested in making bids to supply outright trains to StateRail.

StateRail advised that from a commercial perspective the size of the train orders by New South Wales, and indeed Australia, are small compared to orders received overseas. In addition, StateRail advised that the specific design requirements for its trains that flow from the existing network and operational factors would necessitate substantial modification of overseas 'off the shelf' designs. Most major overseas rail systems consist of single deck carriages, although the number of systems with double deck trains is gradually increasing.

StateRail advised that the low volume and high modification factors combine to make overseas suppliers not interested because it is not commercially attractive. The required modification factors arise not only from the network requirements but also from climatic and local customer requirements.

Purchases occur about every decade

Under the current CTC arrangements, major suburban train purchasing occurs infrequently, about every decade.



Source: StateRail Records

There are high costs involved with irregular purchasing of new designs:

- design costs (\$15 to \$25 million according to StateRail advice)
- tendering costs for all parties concerned
- prototyping of new trains and all the risks that go with this.

The unsuccessful Australian suppliers have a difficult environment when it comes to maintaining appropriate skills, knowledge and facilities for the 10 years until the next tender is called.

A paper that was put to the StateRail Board meeting of 1 November 2002, about the development of a strategic procurement plan for rollingstock, comments on the industry's 'fragility'. Appendix 3 contains extracts from this paper.

There is a risk of the current situation perhaps leading towards a monopoly market in Australian passenger rollingstock. Monopolies rarely lead to good value.

Alternative purchasing methods need to be explored

There are grounds for considering whether alternative methods of purchasing may give a better value for money environment. StateRail should explore whether long term partnership arrangements with various suppliers may provide a better result all round.

2.4 Train Maintenance

For the first time maintenance was included in the contract

StateRail tried to sustain the Australian rail industry and also create train supply competition by including maintenance of the Millennium Train in the contract. This follows the current world trend of transferring (outsourcing) train maintenance to the private sector, preferably the manufacturer/supplier.

StateRail considered that it benefited from:

- cost savings (through competitive tendering)
- transferring design and product performance risks to the train supplier in order to minimise whole of life asset costs
- avoiding the capital costs involved with establishing a specialised maintenance centre because of the level of technology now used in trains
- creating a contestable market for fleet maintenance and acting as catalyst for internal workplace reform and attendant efficiency gains
- creating an improved product (with better operational and reliability performances)
- having a lower level of direct involvement in the detailed design of the train (as EDI Rail was required to design to performance specifications) and hence reduced project management costs.

The StateRail Board was advised on 25 June 1998 that the tendered maintenance prices were expected to incorporate a 'risk premium' when compared to in-house (Passenger Fleet Maintenance) maintenance costs. The Board was also advised that this was consistent with the experience of United Kingdom rail operators who had pioneered train acquisition through design, build and maintain structures.

It is not apparent that the cost of such a risk premium was estimated or made known to the StateRail Board and/or the then Minister for Transport. Nonetheless the decision was taken to include maintenance as part of the contract, as there were other perceived long term benefits as outlined above. The Contract requires a superior performance from this train in both reliability and availability over the rest of the fleet and penalties apply to the contractor if these contractual performances are not met.

**A Ministerial
direction excluded
maintenance for all
future acquisitions**

Representations were made to the then Minister for Transport by the unions involved in maintaining railway rollingstock about StateRail's inclusion of maintenance in future new rollingstock acquisitions. The unions claimed that:

- the maintenance work could be performed in-house at competitive rates
- StateRail was in danger of losing valuable skills over the longer term in rollingstock maintenance.

The then Minister for Transport considered the claims and wrote to the then Secretary of the Labor Council on 22 May 2001 advising:

I have agreed to instruct the SRA to call tenders for Design and Build only.....I note that the existing contract for 81 carriages of the Millennium train has already been let, but any additional rollingstock ordered will be on the basis of design and construct tender only.

The then Acting Chief Executive of StateRail wrote to then Minister on 14 June 2001 to clarify whether this advice to the Labor Council applied to Millennium Train Contract Stages 2 and 3. Subsequent stages of the Millennium Train have proceeded on the basis of maintenance being included. However, the contracts for the new outer suburban electric and Hunter diesel rail cars excluded maintenance.

Recent StateRail estimates of the Millennium Train indicate that maintenance costs are slightly less than the remainder of the electric fleet, and provide for higher levels of availability, reliability and the significant additional features in the train.

StateRail needs to assess carefully the benefits and risks of its train maintenance arrangements to resolve a clearer position as to which arrangements provide the best value for money.

3. Timing, Cost and Quality Outcomes

3.1 Introduction

Purchasing new trains is costly and time consuming. StateRail/CityRail publicity material describes the Millennium Train in such terms as “state of the art” and “innovative”. This is because the train incorporates the latest computer technology, improved design standards and levels of comfort. Accordingly the acquisition of the Millennium Train, as indeed does any other complex piece of plant and equipment, for example submarines, has significant inherent risks because there are many things that can go wrong.

This section of the report comments about StateRail’s achievements (outcomes) in the key performance areas of:

- delivery and cost
- meeting its own technical specification.

3.2 Delivery and Costs Achievements at Time of Our Review

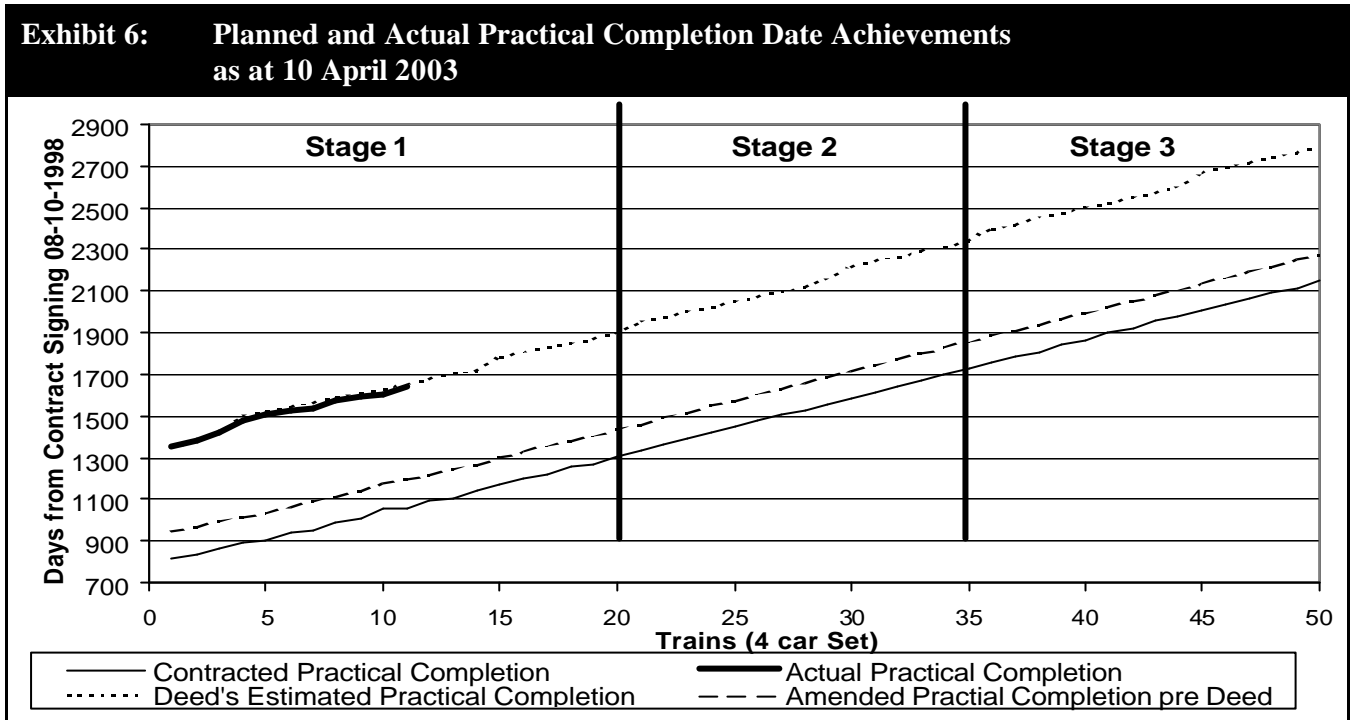
The contract had explicit financial incentives...

The Contract for the Millennium Train had explicit financial incentives to deliver the train on time, if not early, and in accordance with the performance specification. These incentives included:

- liquidated damages of \$2,000 per day per 4 car set. This was capped at 5% of the design and build price for a set, and in total for all sets in a stage. For Stage 1 this was approximately \$520,000 for a set and a \$10.5 million in total for the Stage (November 2002 prices).
- payment not being made for a set until it achieves practical completion (accepted for service by StateRail). EDI Rail therefore bears the cost of delay and any under performance because it has to meet finance costs incurred beyond the contracted delivery date.

...but delivery was still very late

The first 4 car set achieved practical completion on 28 June 2002. The originally contracted practical completion date was 4 January 2001. This was a variance (delay) of 541 days or 18 months approximately.



Source: StateRail Records

Note: StateRail has only formally committed to Stages 1 & 2 as at 10 April 2003

Prior to EDI Rail lodging a claim for variations (the 'Stage 1 Resolution Proposal') on 16 July 2001, StateRail had authorised two delivery date variations. These variations amended the contracted practical completion date to 15 May 2001 due to:

- moving the crew cab wall (21 days but no cost)
- changing from a swing to a power operated crew door because of crew occupational health and safety concerns (110 days and \$3.1 million cost).

Therefore practical completion on 28 June 2002 was 409 days or 13.5 months later than the revised delivery date.

Financial penalties for late delivery are not applied by StateRail

As we stated in our report on the Tangara Contract Finalisation,⁹ liquidated damages are generally included in StateRail contracts, but rarely, if ever, acted upon. This was again the case with the Millennium Train. StateRail advised that on many occasions it reiterated to EDI Rail that delays were subject to liquidated damages. However, StateRail did not apply liquidated damages in this case as the claim (which included a claim for extension of time) was still being negotiated at the time of the delivery of the first 4 car sets.

⁹ The Audit Office of NSW Performance Audit Report: *Tangara Contract Finalisation*, November 1996, Page 28

StateRail took the view that payment upon delivery of each set meant the finance costs imposed a significant impost on EDI Rail and outweighed the liquidated damages.

StateRail had varied the payment terms for the Millennium Train following its experiences with the Tangara. The 'payment upon delivery' of each set saw EDI Rail go significantly into the red on the Contract and having to be financially subsidised through its parent company, Downer EDI.

A claim was made on StateRail for additional time/money

In April 2001 StateRail considered that it was likely EDI Rail would submit a claim to reduce the liquidated damages. In due course a claim was made on 16 July 2001 (the earlier mentioned 'Stage 1 Resolution Proposal'). This claim was for an extension by StateRail to the delivery dates, which would reduce or eliminate liquidated damages, and ultimately increase the train's price by approving a further variation to the already amended contract delivery dates.

Following negotiation of this matter, which was delayed while EDI Rail concentrated on delivering the first 4 car set and compiling/submitting a tender for the outer suburban train, a commercial settlement was reached between the parties. EDI Rail had submitted its consolidated (final) claim on 18 September 2002. On 18 November 2002 a Deed of Release and Variation (the Deed) was executed between StateRail and EDI Rail.

A grandparent company guarantee was required following the takeover of EDIL

EDIL had told StateRail in December 2000 that its Board had agreed to a takeover by Downer. This was duly completed in March 2001¹⁰, when the shareholders agreed to the Downer and EDI merger. Subsequently the merged entity was renamed Downer EDI. EDI Rail wrote to StateRail on 18 May 2001 advising of 'change of effective control', at which time StateRail sought legal and financial advice on this change in control.

The legal advice was that the parent company guarantee with EDIL¹¹ was still valid. However, it recommended that there be a further (grand) parent company guarantee sought from the new entity, Downer EDI. On 7 November 2001 StateRail wrote to EDI Rail seeking this guarantee. However, by then EDI Rail had already lodged its resolution claim.

¹⁰ Downer EDI Annual Report 2001

¹¹ EDIL was the holding company for EDI Rail. EDIL was taken over by Downer and the new combined entity was renamed Downer EDI

StateRail advised that it was considered unlikely that any earlier approach to Downer on the parent company guarantee would have progressed, particularly during the period when shareholders were deciding on the merger and the application was with the Australian Stock Exchange.

We acknowledge that there would have been little if any likelihood of obtaining a parent company guarantee from Downer prior to the merger being finalised. However, this occurred in March 2001, giving a window of opportunity of four months before EDI Rail's claim was submitted. This window was reduced to two months as EDI Rail's advice to StateRail about the merger was delayed, despite immediate advice of such matters being a condition of the Contract.

The importance of the guarantee is pivotal as the following legal advice to StateRail on the resolution claim illustrates:

EDI Rail is a wholly owned subsidiary of Downer EDI Limited....
There is no parent company guarantee in place exposing Downer to any obligation to stand behind EDI Rail, and it is not inconceivable that Downer might cut loose EDI Rail, reducing it to the status of a paper company. In that event SRA¹² would have to re-let the contract at what would be undoubtedly be a far greater cost ...

StateRail advised that it considered this situation was, however, very unlikely as Downer had merged with EDIL to enter the railway market and to gain the advantage of the long term maintenance contracts that EDI Rail had established.

Obtaining this guarantee became part of the EDI Rail claim settlement.

StateRail has advised that this was amongst the first items agreed by Downer in the claim negotiation and that it was not a significant negotiating issue. Whether the terms of the settlement may have improved if StateRail had received the guarantee in the available window before the claim was lodged is uncertain. We believe it would have been desirable.

¹² SRA: State Rail Authority (StateRail)

It was decided to negotiate a commercial settlement

StateRail undertook a detailed review of EDI Rail's claims and decided that some aspects of the claim had merit. EDI Rail had also indicated an unwillingness to proceed with Stages 2 and 3 of the contract without substantial restructuring of the contract costs. And there was concern that EDI Rail may withdraw from the contract altogether.

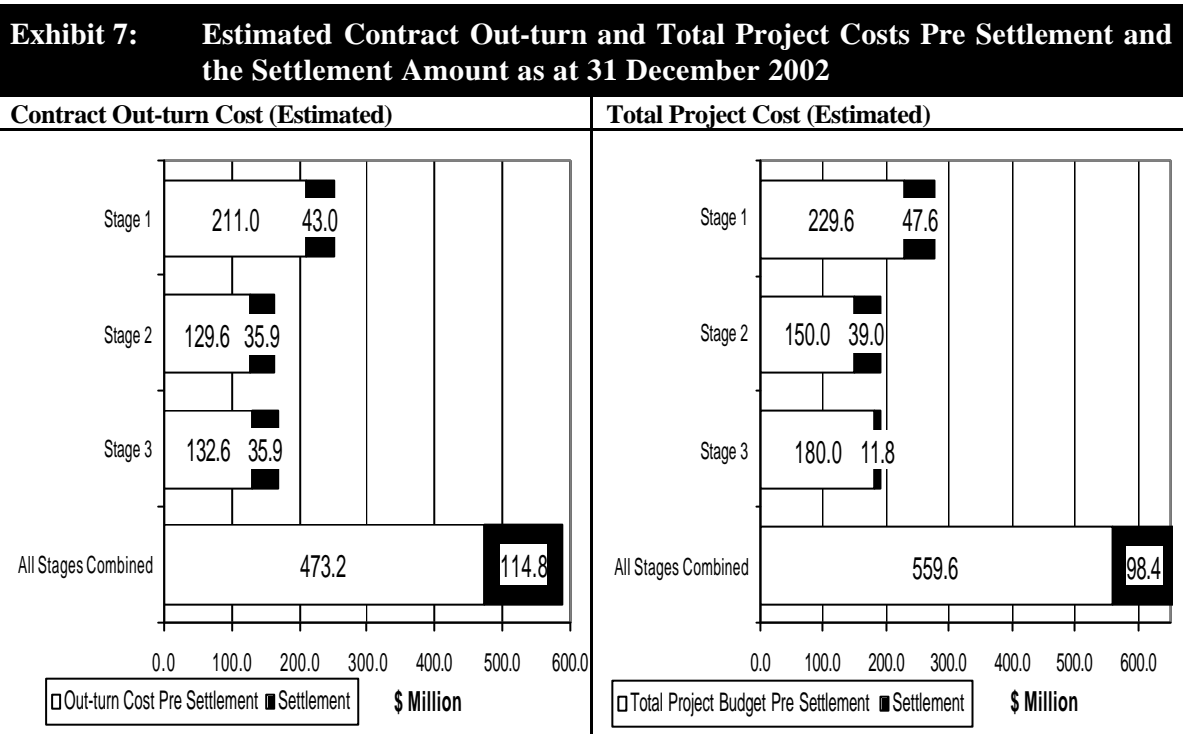
The StateRail Board on 28 June 2002 approved a commercial settlement being negotiated with EDI Rail rather than risk an unknown outcome from arbitration and possible litigation as well as the significant cost of re-tendering should this result. Non-financial costs would also have been a factor in this matter as articles began appearing in the print media as from March 2001 about the Millennium Train's late delivery.

EDI Rail, in its consolidated claim of 18 September 2002, sought additional time and ultimately costs under the contract for a range of matters including:

- liquidation and insolvency of the sub contractors for the communications and surveillance system and the bogie anti-roll bar. Therefore replacement sub contractors had to be found and engaged
- signal interference testing by RIC had indicated that there were unacceptable rail return currents, when completing the electrical circuit, by the Millennium Train. StateRail and RIC have advised that this was not a safety issue but it had on-time running implications. StateRail engaged experts from the United Kingdom and Hong Kong who advised on the results and subsequently RIC endorsed the train to operate as 4 and 8 car sets without restriction. However, the train was withdrawn from service on 10 April 2003, for seven weeks approximately, for further prototype testing of this and other issues
- instances where train crews and/or track possessions were not available for commissioning tests
- performance specifications for bogie wheel unloading (derailment) and crashworthiness that EDI Rail considered impossible to achieve, which EDI Rail expended considerable time and effort trying to achieve
- extensive negotiation and ongoing revision of crew control driver's cab which impacted upon design development
- innovations and enhancements beyond the contract and tender amount.

The Millennium Train's capital costs have increased because of the settlement...

The effect of the commercial settlement with EDI Rail is that the Contract (out-turn/capital) cost of the Millennium Train and the total project cost have increased for all three stages by \$114.8 million or 24% to \$588 million, and \$98.4 million or 17% to \$658 million respectively.



Source: StateRail Records

Note: The Contract Out-Turn Cost (Capital Cost) and Total Project Cost includes escalation and custom duties estimates. While the Total Project Cost includes estimates for project management, train introduction and contingency funds

... but the settlement had no impact on maintenance costs

StateRail advised that the Deed had no impact on the maintenance costs of the Millennium Train. However, because of variations in the technical specification, for example the powered crew door, maintenance costs have risen by 1%. The tendered prices for maintenance for Stages 1, 2 and 3 as at June 1998 for 35 years were \$233.2 million, \$149.2 million and \$145.5 million respectively (overall \$527.9 million). These prices are subject to escalation and foreign exchange adjustment.

The price of the Millennium Train is still better than that paid by others

Exhibit 8 below compares costs of recent train purchases in other Australian jurisdictions. Caution must be exercised in drawing conclusions from this comparison of train purchase costs. However, some sense of the cost implications of different approaches is apparent.

Exhibit 8: Comparison of Millennium Train Capital Cost with Recent Train Purchases in Other Australian States						
Item	StateRail\ Pre Deed	StateRail Post Deed	Queensland	Western Australia	Victoria Network A	Victoria Network B
Number of Cars	201	201	90	93	174	186
Car Deck Type	Double	Double	Single	Single	Single	Single
Capital Cost \$ Millions	554.3	651.8	251.1	254.1	332.0	330.0
Off the Shelf	No	No	No	Yes	Yes	Yes
Crush Load Capacity of Purchase (Seated and Standing Passengers)	53,000	53,000	15,060	17,794	23,258	29,760
Average Cost \$ per Car	2,757,547	3,243,005	2,790,000	2,732,258	1,908,046	1,896,552
Average Cost \$ per 4 Car Set	11,030,189	12,972,020	11,160,000	10,929,032	7,632,184	7,586,207
Average Cost \$ per Passenger	10,458	12,299	16,673	14,280	14,275	14,189

Source: StateRail Records, Parliamentary Hansards and Committee Reports, Ministerial Press Releases and Website Pages.

Notes:

1. Construction of Maintenance Facilities has been excluded
2. The dollar values for other than StateRail are unaudited and should be regarded as indicative only
3. GST has been excluded

On a per passenger cost basis the Millennium Train purchase appears to be favourable compared to other recent Australian train purchases.

Other factors being equal, cost per:

- 4 car set basis should be lower for large orders
- passenger should be lower for double deck cars.

Value for money and risk management material was not provided to key decision makers

When key decision makers were considering the award of contracts for the purchase of new Hunter and Outer Suburban trains they were provided with:

- value for money comparisons of world wide train purchases
- risk management plans.

There was no such value for money analysis and/or risk management plan provided to key decision makers (the StateRail Board and/or the then Minister for Transport) when the Millennium Train purchase was under consideration. StateRail advised that the value for money analysis was not provided because the tendered cost of the Millennium Train was consistent with the earlier estimated cost.

Since the Deed's signing, EDI Rail has been achieving practical completion of 4 car Millennium Train sets in line with the Deed's revised dates, that is one 4 car set a month, see Exhibit 6. However, there is currently a dispute between EDI Rail and a sub contractor. Downer EDI had launched a takeover bid for this major sub contractor, however, this has been unsuccessful. There is now a legal process underway to resolve the contractual differences.

It needs to be borne in mind that aspects relating to comfort and quality of service for CityRail's customers would have been affected by:

- delayed retirement of life expired rollingstock, the Tullochs, and hence lesser passenger comfort and security
- overcrowding on trains on some lines not being alleviated in a timely manner, (refer Section 4.2 *Train Loading Standards Compliance*).

3.3 Compliance with Technical Requirements

Trains are technically complex pieces of equipment. The Millennium Train contract contained over 237 pages, approximately 2,500 technical requirements for the train. There are some 85,000 steps/activities involved in actually building the train.

Extensive commissioning tests were done

StateRail advised that from the time of the arrival in Sydney of the first 4 car Millennium Train set on 30 November 2001, until its notice of practical completion was given on 28 June 2002, the train operated for 3,000 hours under commission testing. This included 1,000 hours or 40,000 kilometres of on track testing. At the time of our review there was still some testing to be undertaken, for example energy efficiency and 16 car operation, as it has not yet been possible to perform them or they have been deferred.

The Millennium Train was withdrawn from service on 10 April 2003 to undertake further prototype testing. The main areas where problems have occurred are:

- traction system
- doors
- communications system
- air conditioning
- signalling interference.

The Millennium Train returned to service on 2 June 2003 with the first non peak hour passenger service occurring. The Minister for Transport Services announced that the Millennium Train would gradually return to service over the following three weeks.

The entry of the Millennium Train into revenue service shows there has been some significant project management, engineering and construction achievements. This in many ways demonstrated the capacity of all those concerned to produce to world-class standards.

A key factor in EDI Rail winning the Millennium Train contract was EDI Rail being prepared to guarantee a reliability of one incident¹³ per 100,000 kilometres travelled per 4 car set. This reliability level was after a two year settling in period. A contractual service availability level on each business day of 95% is also required for 4 car Millennium Train sets. There are financial incentives and penalties through the Contract's maintenance payments in respect of service availability and reliability.

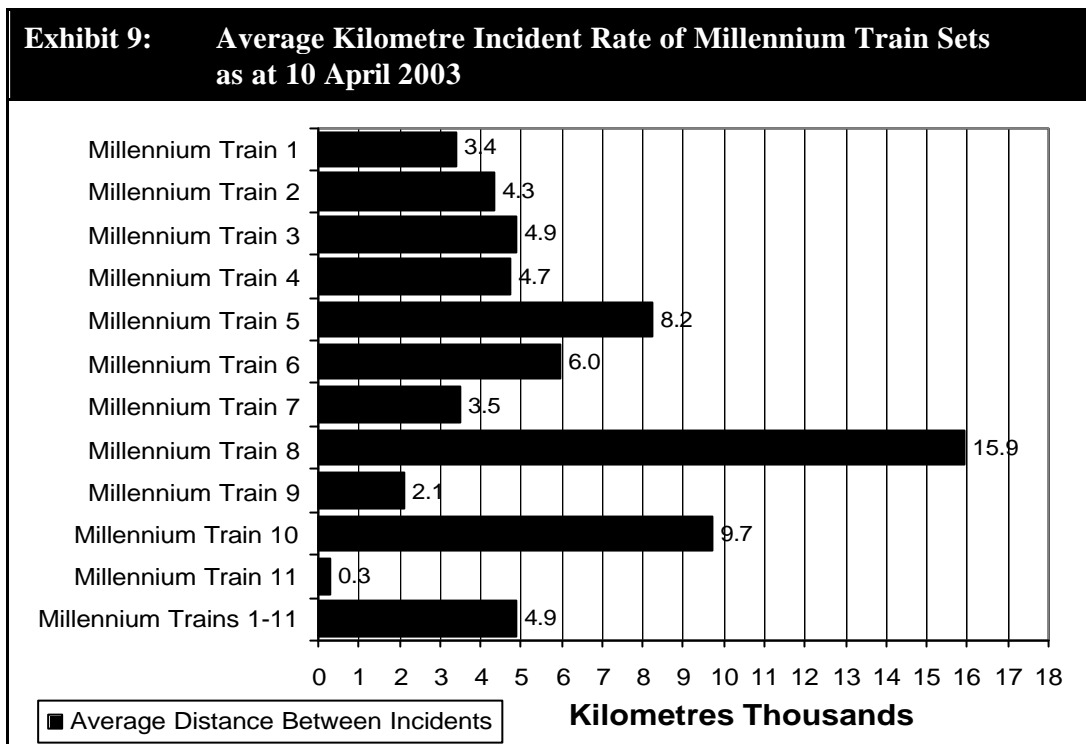
The Millennium Train first entered revenue service on 1 July 2002 with one 4 car set. Up to 10 April 2003 StateRail has accepted another 10 sets (40 cars) and these have progressively entered into revenue service. However, the sets have not operated continuously in revenue service, for example:

- two of the earlier sets were withdrawn for three months in order to undertake 8 car set commissioning tests as per the Contract requirements
- sets only operated in the off peak period until early December 2002
- sets were withdrawn for problem rectification.

In the period 1 July 2002 to 10 April 2003, the 11 Millennium Trains 4 car sets delivered and operating, have in totality travelled in revenue service only 313,297 kilometres and the cars individually 1,253,187 kilometres all up.

In performance terms this is limited. Thus while the Millennium Train appears to have the potential to achieve the capability specified in the contract, it is not possible to be conclusive at this time.

¹³ An incident is defined as any equipment failure or defect that results in a service delay of more than 3 minutes while in revenue service.



Source: The Audit Office Analysis of StateRail Records

Note:

1. This exhibit shows the average incident rate of each Millennium Train 4 car set while in revenue (timetabled) service from 1 July 2002 to 10 April 2003 and the sets overall. Incidents that occurred while the Millennium Trains were not in revenue service are excluded.
2. Millennium Train Sets 8 and 11 have had no incidents and the figure recorded is the distance travelled by the set while in revenue service.

StateRail indicated that it considered the first 4 car set as a prototype and the first 5 to 10 train sets generally operate to identify and rectify problems.

StateRail has advised that it is confident that the performance of the Millennium Train will meet, if not exceed, the specified requirements.

The project steering committee and the StateRail Board are being provided with information on the Millennium Train's reliability and availability. However, this information does not readily show the Millennium Train's specified availability and reliability requirements performance achievements.

Notices of practical completion are given detailing defects...

When StateRail accepts a Millennium Train set, StateRail gives a 'notice of practical completion' to EDI Rail. Accompanying the notice are schedules detailing commissioning tests not performed, test failures and defects in the set. The following Exhibit compares the notice's accompanying schedules for Set 1 and 4.

Exhibit 10: Sets 1 and 4 Practical Completion Notices Accompanying Schedules				
	Set 1		Set 4	
Date of Practical Completion	28 June 2002		29 November 2002	
Schedules Accompanying Notice	No. of Pages	No. of Matters	No. of Pages	No. of Matters
Schedule 1 - commissioning tests not carried out or deferred to a later time	1	18	1	7
Schedule 2 - commissioning tests failed to pass but will be accepted	1	1	1	1
Schedule 3 - defects to be rectified arising from failure to pass commissioning and other tests	19	172	14	192
Schedule 4 - defects which will be accepted	50	465	0	0
Schedule 5 - defects to be rectified	45	545	13	154
Total	116	1,201	29	354

Source: StateRail Records

The number of non compliances with the contract's specification (that were previously listed as defects under the notice's Schedule 4) had gone from 465 in Set 1 to zero in Set 4.

Many non conformances (defects) have been accepted

This is because under the Deed there were 531 technical non conformance matters that StateRail agreed would not be treated as defects. In addition, the Deed listed a further 22 technical non conformances subject to the results of the testing program.

The overall effect is that the technical specification of the train has been amended. A paper submitted to the StateRail Board meeting of 29 November 2001 advised that:

... specification omissions or amendments will not allow a deficient or defective product to be delivered to SRA, but will provide a Millennium Train which has different properties from those particularised in the original contract specification.

The Millennium Train was accredited, from safety and operational aspects, to operate on the suburban rail network by both the former Department of Transport (DoT) and RIC on 25 June 2002. This accreditation was given despite the non conformances with the contract's technical specification for the train. An example of an accepted non conformance is the unladen (tare) weight of the initial Millennium Train 4 car set is currently 30 tonnes approximately over the specified weight for a 4 car set (180 tonnes).

A 4 car Millennium Train set is the heaviest suburban passenger train in service. Action is being undertaken to reduce the unladen weight of a 4 car Millennium Train set to 205 tonnes. But even so it will still be the second heaviest in the CityRail fleet. Only the intercity V sets, at 213 tonnes unladen weight, are heavier.

While many of the non-conformances may be minor, the sheer number of them raises issues about the process of specifying the train. The following extract from a report made to StateRail about the resolution claim is pertinent to this matter:

In system engineering terms, the 4GT¹⁴ Specification provided no “design space” within which the overall system performance could be optimised. There was no space where all of the specified requirements could be simultaneously satisfied.

In the administration of the Millennium Train Contract, SRA has been a party (either wittingly or unwittingly) to design decisions based on unstated and untested assumptions, for example: “It is more important to strive to achieve 50% wheel unloading and 50kph crashworthiness, than it is to meet the 180 tonne maximum weight specified”.

We are strongly of the view that this fundamental issue of available “design space” should be seriously considered by SRA when entering into future contracts with similar specification provisions and Systems assurance requirements as those contained in the 4GT Contract, in order to prevent another undesired outcome.

StateRail advised that the accuracy of specifications improves if they are evolutionary in development. However, with irregular train purchasing this presents difficulty in developing a specification that is fully achievable without modification. To reduce this risk, the specification was put to industry prior to the tender to obtain feedback. Changes were made, however, the level of feedback was not extensive or comprehensive.

While the Millennium Train contract is far more performance based than previous contracts it is not as performance based as would be preferred. The specifications may not have given due weight to the Millennium Train being a prototype train and therefore unlikely ever to achieve all the specifications set for it.

¹⁴ Fourth Generation Train

4. Other Significant Process and Performance Matters

4.1 Introduction

This section of the report comments upon process and other performance matters, including:

- train loading standards compliance
- the environment in which the purchase occurred
- restructuring of the New South Wales rail industry
- intellectual property rights
- perceived probity audit conflict of interest
- risk management
- customer and staff information campaign expenditures.

4.2 Train Loading Standards Compliance

The train loading (crowding) occurring on services on existing lines is a significant factor in deciding whether to purchase additional rollingstock for the CityRail fleet.

In fiscal 2001-02 StateRail received approximately \$424 million community service (social program) funding for the rail services provided. This funding is provided under the CityRail Service Agreement¹⁵ (the Agreement) executed annually between StateRail and the Transport Co-ordination Authority (formerly the Department of Transport).

A loading standard has been specified

Schedule 2 of the Agreement specifies a train loading standard as part of the determination of the adequacy of services provided:

2. LOAD STANDARDS

2.1 On CityMet¹⁶ corridors:

- (a) No train to have a load factor of greater than 135% of specified seating capacity, except by passenger choice.
- (b) No passenger to stand on a train for more than 20 minutes, except by passenger choice.
- (c) Any passenger who chooses not to catch a train due to either excessive load or potential excessive standing time will have a service which gets to the destination no more than 15 minutes earlier or later than the original service and meets the set service standards.

In a practical sense this means 0.35 passengers on average will be standing for each seated passenger or alternatively 1.35 passengers per seat.

¹⁵ The agreement is made under section 104E of the Transport Administration Act 1988 because StateRail, in providing appropriate services on behalf of the Government, suffers significant financial loss in meeting these obligations and accordingly is reimbursed.

¹⁶ CityMet¹⁶ means rail corridors which comprise all stations within the Sydney metropolitan area, bounded by Berowra, Richmond, Penrith, Macarthur, Waterfall and Cronulla inclusive.

Given the competition between work and home that can occur and the need to connect with other services (train, bus, ferry) some passengers have little if any choice about the train service they catch.

The former DoT did not monitor compliance until 2001-02 ...

StateRail advised that:

- these loading standards had been specified in the Agreement since the early 1990's
- it was not until 2001-02 that train loading information was included in the reporting schedule compiled by StateRail and submitted to the former DoT in accord with the Agreement.

... and they have been exceeded ...

The specified loading standards have been exceeded.

Exhibit 11: Train Loads by Line Survey April 2002 One Hour of Peak 07.30-08.30 Hours at Central				
Line	Service	Measured at	Number of Trains	Mean Load Factor
<i>Illawarra</i>	Cronulla - City	Sydenham	4	145%
	Waterfall - City	Sydenham	4	125%
	Sutherland - City	Sydenham	1	95%
	Mortdale/Hurstville - City	Sydenham	4	100%
	Illawarra Suburban Total	Sydenham	13	120%
<i>Eastern Suburbs</i>	Bondi Junction – City	Kings Cross	13	75%
<i>East Hills</i>	Campbelltown via Airport	Wolli Creek	3	100%
	East Hills via Airport	Wolli Creek	4	110%
	Macarthur via Sydenham	Sydenham	4	135%
	East Hills Suburban Total		11	115%
<i>Bankstown</i>	Bankstown - City	Sydenham	6	95%
<i>South</i>	South via Granville - City	Redfern	6	105%
	South via Regents Park - City	Redfern	2	80%
	South Suburban Total	Redfern	8	100%
<i>Inner West</i>	All stations - City	Redfern	4	110%
<i>West</i>	The Heron (Emu Plains - City)	Redfern	1	105%
	Emu Plains, Penrith Fast/Medium - City	Redfern	6	120%
	Penrith, St Marys, Blacktown Slow - City	Redfern	4	120%
	Richmond - City	Redfern	2	115%
	Carlingford - City	Redfern	1	100%
	West Suburban Total	Redfern	14	115%
<i>Main North</i>	Hornsby - City Fast	Redfern	4	130%
	Main North Slow	Redfern	4	125%
	Main North Suburban Total	Redfern	8	125%
<i>North Shore</i>	Wyong/Gosford - City	St Leonards	3	120%
	Berowra - City	St Leonards	2	150%
	Hornsby - City	St Leonards	4	115%
	Gordon - City	St Leonards	4	125%
	North Shore Total	St Leonards	13	125%

Source: StateRail Records

Note: This survey was done over two days, 9 and 10 April 2002. The above information is only for one hour of the peak, 07.30 to 08.30 hours arrival at Central.

Exhibit 12: Train Loads Yearly Report 2001-02			
	Morning Peak	Afternoon Peak	Daily
Services with loading above 135%	7.9%	4.0%	1.4%

Source: CityRail Service Agreement Reporting 4th Quarter 2002

This overcrowding has been occurring for a number of years now on some lines. For example the Illawarra Line has had overcrowding since 2000. Since March 2000 articles have periodically appeared in the print media about train overcrowding. Overcrowding of trains has also featured in submissions to Independent Pricing and Regulatory Tribunal about fare determinations since 2000.

Forecasted non-compliance with the specified load standards as from mid 1998 was one of the reasons for acquiring the Millennium Train.

Loading breaches have not been publicly reported

The annual reports or web pages of the former DoT and StateRail/CityRail have not publicly reported train loading standards breaches having occurred.

The Agreement does provide for publication of any breaches and a range of other information, including service provision in accordance with loading standards.

Public accountability, and pressure for performance improvements, will be enhanced if such information is made readily available.

4.3 The Purchase Environment at StateRail

Changes occurred during the purchase which had a disruptive effect

The Millennium Train purchase (project) is long in duration. In its life to date, changes have happened in the purchase environment. For example, at the time of our review (up to 10 April 2003) the:

- Minister for Transport changed twice
- composition of project steering committee (Millennium Train Executive Committee) changed. For example:
 - ⇒ chief executive officer changed six times
 - ⇒ chief financial officer changed twice
 - ⇒ general manager passenger fleet maintenance changed three times
 - ⇒ chief operations manager changed once
 - ⇒ project manager changed three times
 - ⇒ project has moved around within the StateRail organisational structure five times since 1996.

The environment in which purchase of the Millennium Train's occurred has been a disruptive one. We believe that this has had some effect.

Involvement of StateRail Internal Audit

Similarly, StateRail's internal audit went from being a member of the project steering committee to that of a 'watching brief' status only.

In the period since the signing of the Millennium Train contract until the time of our review, there have been three formal internal audit reports/comments in respect of the purchase that we are aware of:

- review of risk management by a leading accounting firm under the co-sourced internal audit arrangement (2001)
- capitalisation of training costs (2002)
- software model being developed to validate maintenance payments (2002).

For a project of such magnitude, more internal audit involvement would be desirable. Our previous audit of the Tangara project highlighted a similar situation. Providing and directing sufficient internal audit resources to address major risks (on a potentially billion dollar project) are an important element of corporate governance that was not optimal here. StateRail advised that internal audit was regularly given updates and had discussions with the Project Manager.

4.4 New South Wales Rail Industry Restructure

The restructure of the rail industry affected the purchase

On 1 July 1996, through the enactment of the *Transport Administration Amendment (Rail Corporatisation and Restructuring) Act 1996*, the then State Rail Authority of New South Wales was split into four organisations:

- Rail Access Corporation
- Freight Rail Corporation
- Railway Services Authority, which following corporatisation on 1 July 1998 was renamed Rail Services Australia
- State Rail Authority of New South Wales.

This had a number of impacts upon the Millennium Train purchase.

Firstly, the engineering and contract administration expertise that StateRail had in train purchasing was transferred to the then Railway Services Authority (RSA). The latter's principal function was to supply goods and services to the rail industry in New South Wales while StateRail's was to operate services.

The Millennium Train purchase was handled by RSA until StateRail took over the project in August 1997, with the appointment of a project manager. The Millennium Train had a dedicated project team at the start of the contract of 10 occupied positions, 4 of which came from RSA. While in 2002, 7 of the 21 occupied position holders came from RSA (later RIC).

RSA and its successor, RIC, were public trading enterprises and as such charged 'commercial' rates for its services. The engagement of the RSA/RIC Rollingstock Consulting Group will cost StateRail approximately \$1.1 million (excluding GST).

StateRail advised that as at 30 April 2003 it had completed negotiations to get this expertise back and key rollingstock employees were transferred from RIC to StateRail.

Secondly, the 1995 StateRail Board at its 13 September 1995 meeting deferred consideration of the paper "Proposed Fleet Acquisition Program for CityRail" until the 13 October 1995 meeting. At this latter meeting the then Board decided that the development and procurement strategy for additional rollingstock be a matter for the 1996 StateRail Board to consider.

At that time, patronage analysis by StateRail showed that there would be a shortfall of suburban rollingstock beginning from mid 1998. An additional 24 cars were identified as being required to cater for patronage growth to 2000, with another 56 cars needed shortly after 2000 to replace the Tullochs as they would be 37 years old. StateRail described the Tullochs as being: technologically obsolete; in a poor state; outdated in terms of customer comfort; and approaching life expired.

Some eleven months later the new StateRail Board at its meeting of 25 September 1996 approved the development of the Millennium Train specification and tender documentation. However, it was not until the StateRail Board meeting of 20 February 1997 that approval was given to tender the purchase of an additional 80 double deck electric cars for the CityRail fleet.

Overall it took approximately 17 months for the StateRail Board to make a decision to tender the purchase of the first tranche of what was to become known as the Millennium Train.

In the rail industry the generally accepted norm is that it takes 4 years (48 months) to purchase new passenger rollingstock from the time approval to purchase (proceed) is given to the delivery of the first set. This is because there is a notable learning curve involved, particularly where the design is new and innovative. The Millennium Train purchase had a very aggressive time frame before key decision makers approved the purchase, and it remained so after approval.

Exhibit 13: StateRail's Timeframes for Purchase of the Millennium Train				
	Tendering, offer evaluation and place order	First train – receive, test, trial and commission	Total	Cars in service by 2000 Sydney Olympics
	Months – Number (Dates)	Months – Number (Dates)	Months Note 1 & 2	Number
StateRail Board Paper September 1995	9 (4/1996-12/1996)	18 (1/1997-6/1998)	27	56
StateRail Board Papers September 1996 & January 1997, & Ministerial Press Release June 1997	10 (4/1997-1/1998)	22 (2/1998-11/1999)	32 + 1	40
StateRail Board Paper July 1997	7 (6/1997-12/1997)	23 (1/1998-11/1999)	30 + 3	24
StateRail Board Paper October 1997	11 (6/1997-4/1998)	23 (5/1998-4/2000)	34 + 3	24
Project Steering Committee February 1998	13 (6/1997-6/1998)	26 (7/1998-8/2000)	39 + 3	8
Contract Unamended	16 (6/1997-9/1998)	27 (10/1998-12/2000)	43 + 3	Not Applicable
Actual	16 (6/1997-9/1998)	46 (10/1998-6/2002)	62 + 3	Not Applicable

Source: StateRail Records

Notes:

1. Months quoted have been treated as whole months, for example April to December 1996 (4/1996-12/1996) is in total 8 months based upon the start and ending of months in this period
2. The + (plus) number quoted is for the months elapsed between the decision to proceed in late February 1997 and the start of tendering

Public pronouncements made in the middle to latter part of 1997 raised public (passenger) expectations as to when there would be a new train. These expectations were unlikely to be met, and were not. It is noted that the Contract never intended for the train to enter service prior to the 2000 Sydney Olympics.

The 'Olympian' tag created reputation risks. Comments about its lateness began appearing in the print media from early March 2001. This was despite there having been further public pronouncements revising the expected date of entry into service of the Millennium Train.

4.5 Intellectual Property Rights

StateRail does not own the design and build intellectual property

StateRail owns all the rights, title and interest in intellectual property (IP) for the maintenance documentation.¹⁷ EDI Rail owns the design and build IP of the Millennium Train. StateRail has a permanent, irrevocable, royalty free and non-exclusive licence to use any of the contract documentation IP.

This split of IP between StateRail and EDI Rail is in accordance with that specified in the request for tender documentation. StateRail advised that while it paid for the design and build the associated IP was of little commercial value. This is because the train was purpose designed and built to suit the Sydney suburban rail network.

Until the Deed of Release was executed on 18 November 2002, the Millennium Train did not have an escrow arrangement¹⁸ in place. In the event that EDI Rail had become insolvent or the contract was terminated, StateRail could have had difficulties in accessing the design and build IP. There is a small annual fee, approximately \$1,000, paid by SRA for the escrow arrangement.

Escrow rights to protect IP rights are not uncommon but seem not as yet to be generally accepted rail industry practice. StateRail advised that the use of an escrow arrangement for IP for rollingstock was still considered to be fairly novel. However, it agreed that future acquisitions should look to establishing such arrangements very early in the process.

4.6 Conflict of Interest

StateRail engaged a leading accounting firm as probity auditors. The probity audit focussed on:

- confidentiality and conflict of interest
- transparency
- accountability
- value for money.

¹⁷ This is specified in Volume 2 Statement of Work Attachment A of the Contract and includes: technical maintenance plan; recommended spares list; operating manuals; maintenance manuals; training materials, software documentation; list of special tools and equipment; all records and data relating to performance of cars and maintenance facility

¹⁸ Under an escrow arrangement the design and build IP material is held in trust by a third party to be turned over to StateRail only upon fulfilment of a specified condition(s).

The probity audit report of 24 July 1998 concluded that the tender process was conducted in a fair and equitable manner with due regard to probity.

The same firm was subsequently engaged by StateRail on 20 November 2000 to provide audit services as part of a co-sourced StateRail internal audit function. One of the internal audit reviews performed by this firm was the risk management review of the Millennium Train mentioned earlier (Section 4.3 *The Acquisition Environment at StateRail*).

There was some commonality of staff from the firm in the Millennium Train probity audit and the risk review. StateRail did not consider this to be a problem as the focus (objectives) of the reviews were different. However, we do not think this was appropriate, as there may be at the least the perception of a conflict of interest.

In the absence of formal standards for probity audit, it can be difficult for agencies to judge what is appropriate. As a guide ICAC's general advice¹⁹ on conflict of interest situations is useful:

The first step is to recognise what situations could give rise to potential conflicts of interest. The second step is to make sure that staff (and contractors) disclose these conflicts. The third step is to decide how to resolve the conflicts or minimise their potential impact.

It is our view that to maintain the full benefit of a probity audit, indisputable independence and absence of conflicts is essential. It is quite common for probity audit services to be used several times during the course of a project. They may even be called upon some time afterwards. Because of this, we consider that probity auditors should be limited to performing work directly related to the probity audit function during the currency of a project or specific matter, and not engaged for other forms of review work related to the same subject area.

¹⁹ Practical Guide to Corruption Prevention, Module 9 Conflicts of Interest Pages 5 and 6, ICAC, 1 June 1996

4.7 Risk Management

StateRail was aware of need for effective risk management

It is apparent that StateRail was aware of the need to effectively manage risks associated with the Millennium Train's purchase and introduction into service. For example:

- a risk management study of design, build and maintain was undertaken by a contractor
- under the contract, EDI Rail compiled a risk management plan which was submitted to StateRail and updates were provided
- the contract provided for 3 purchase orders because of the risk associated with forecasting increase in demand (patronage)
- the initial order size was increased from 80 to 81 to mitigate against the risk of damage to 1 trailer car rendering an entire set inoperable. The base cost of the collision spare trailer car was approximately \$2 million
- commercial and technical risks were assessed as part of the tender evaluation
- risk analysis of introducing a new train into service was undertaken in December 1999 and then again in 2001 resulting in the train being introduced in such a way as to limit risk of impacting upon peak and other services
- there was an extensive train commissioning testing program and no payment would be made until the first set was accepted by StateRail
- StateRail has engaged various contractors over the project's life to review and report on risks, for example contract review from commercial and technical aspects, the delivery program's accuracy and adequacy.

StateRail did enjoy some successes with managing the risks associated with the Millennium Train.

But the contract was risk averse

However, the contract for the Millennium Train purchase was described in a paper, submitted to the StateRail Board meeting of 29 November 2001, in the following terms:

... The Contract conditions, in particular the General Conditions, are extremely risk averse for SRA²⁰ and there is a view that risks were accepted by the Contractor which it was unable to control ...

and

... EDI were originally a support party to a bid led by Alstom. However, upon consideration of the Contract documentation for tender, Alstom decided not to proceed ...

Certainly StateRail, through contractual provisions, sought to implement controls to reduce the risk exposures/events it had experienced with the Tangara. However, as the Guidelines for Managing Risk²¹ note:

Risks can be transferred unfairly if organisations are not mindful of the rights and responsibilities of clients, contractors and other stakeholders. Risk transfer does not reduce overall risk. Spreading the risk through risk transfer does reduce the level of risk to individual entities. Where risks are transferred unfairly or inappropriately, risks may be increased.

Despite the Millennium Train's contractual provisions, StateRail still had significant risk exposures because of the importance of the Millennium Train to CityRail's operations by retiring the Tullochs and reducing overcrowding and the 'fragility' of the Australian rail industry. StateRail (the Government) will always bear the risk of a major project not being completed, as StateRail is not in a position of being able to simply walk away from the project, unlike the private sector.

4.8 Customer and Staff Information Campaign Expenditure

As part of the Millennium Train project there was a customer and staff information campaign (the campaign) with an approved budget of \$745,150. The source of funds for the campaign's budget was the Millennium Train's capital funding allocation.

²⁰ SRA: State Rail Authority (StateRail)

²¹ Guidelines for Managing Risk in the Australian and New Zealand Public Sector, Standards Australia, SAA/NZS HB143:1999

As at 21 November 2002 an amount of \$400,435 had been expended on the campaign. Exhibit 14 shows the campaign elements budgeted and actual expenditures.

Exhibit 14: Millennium Train Customer and Staff Information Campaign			
Item	Budget \$'000	Expenditure \$'000	Balance \$'000
Mainstream media, the 24-sheet billboards and 30 second TV commercials	545	248	297
Staff and customer commemorative mementos, including public launch,	100	108	(8)
Staff education including road shows	100	44	56
Total	745	400	345

Source: StateRail Records

Overall the campaign's expenditure was \$345,000 under budget primarily because the television campaign will not be going to air until later in 2003. StateRail is waiting until the Millennium Train returned to service²² on 2 June 2003 and there are adequate numbers of Millennium Trains operating on the network. The campaign will include a public education aspect, addressing amongst other things the features new to Sydney's trains such as the surveillance, passenger information systems and traction interlocking of doors.

It would seem that the Millennium Train has been given a higher marketing profile than other new trains introduced into service by StateRail. In view of the Millennium Train's lateness (from the public's perspective), cost escalation and initial teething problems this level of self-promotion may not be universally well received.

²² The Millennium Train was withdrawn from service for seven weeks approximately during the period 10 April 2003 to 1 June 2003 to undertake further prototype testing, refer Section 3.3 *Compliance with Technical Requirements*

Appendices

Appendix 1 Audit scope and objectives

Millennium Train Audit Objectives	<p>The objectives of the Millennium Train Project audit were to:</p> <ul style="list-style-type: none">▪ assess the economy, efficiency and effectiveness of StateRail's management of the project▪ consider any implication the audit may have for other significant asset acquisitions not only for StateRail but also for other NSW public sector agencies.
Audit Criteria	<p>The following criteria were applied during the audit (whether):</p> <ul style="list-style-type: none">▪ StateRail implemented changes in practice and/or performance in response to the Tangara Performance Audit Report recommendations▪ StateRail has effectively managed risks associated with the purchase of new rollingstock, particularly product timing, cost and quality (the latter includes both safety and reliability)▪ StateRail established and operated effective project management arrangements for the Millennium Train, that is, the way in which the project was planned, organised, directed and controlled was consistent with better practice.
Audit Approach and Methodology	<p>The audit approach and methodology included:</p> <ul style="list-style-type: none">▪ research, review and analysis of relevant literature and researched better practice on managing major projects▪ review and analysis of StateRail documentation▪ interviews with representatives of StateRail, the former NSW Department of Transport (now Department of Urban and Transport Planning and/or Transport Co-ordination Authority) and Rail Infrastructure Corporation (NSW)▪ discussions with operators, both public and private sector, of rail services in other major Australian State capital cities
Cost of the audit	<p>The cost of the audit was \$242,990. This figure includes the estimated cost of printing the report (\$6,500).</p>
Acknowledgement	<p>The Audit Office gratefully acknowledges the cooperation and assistance provided by representatives of: StateRail; Office of the Coordinator General of Rail; Department of Urban and Transport Planning; Transport Co-ordination Authority; Rail Infrastructure Corporation (NSW); Queensland Rail; Western Australia Government Railways Commission; Office of the Director of Public Transport - Department of Infrastructure, Victoria; operators of public transport rail services in Melbourne – Connex and National Express Group; and EDI Rail.</p>
Audit team	<p>Ai-Binh Phu, Steve Sullivan (Project Manager) and Stephen Horne (Director)</p>

Appendix 2 Chronology of Key Events

Date	Event
16 June 1995	Group General Manager, CityRail approves commencement of development for Fourth Generation Train (4GT)
29 September 1995	Report (business case) on the acquisition of 4GT
13 October 1995	StateRail Board notes paper put to it, at 13 September 1995 meeting on development and procurement strategy for additional suburban rollingstock (the 4GT). However, the Board deferred its consideration of the matters until there was a new Board following NSW rail industry restructure
30 October 1995	Ministerial announcement, in conjunction with delivery of last outer suburban Tangara set, that development underway for 4GT, which is to be available prior to the 2000 Sydney Olympics
20 February 1996	Value management study of the 4GT undertaken and report provided to StateRail
1 July 1996	NSW rail industry is restructured into 4 separate entities
25 September 1996	StateRail Board approves development of 4GT specification and tender documentation
21 January 1997	Industry presentation held for those parties interested in tendering for 4GT
20 February 1997	StateRail Board approves acquisition of 80 4GT electric cars at a total purchase price of \$212 million (1995/96 dollars). The Board also approves that the acquisition process require tenders to provide for a design, build and maintenance contract
30 May 1997	Minister for Transport approves calling of public tenders for 4GT project
2 June 1997	The Minister for Transport announces that a new suburban train is being acquired, the delivery of which will commence in late 1999. The new train was subsequently christened 'The Olympian' because it was to be in service for the 2000 Sydney Olympics
4 June 1997	Advertisements placed calling for pre-registration of tenders for 4GT project
13 June 1997	Closing date for the submission of requests by interested parties for pre-registration as a tenderer for 4GT
22 July 1997	Request made by StateRail for pre-registered tendering organisations to submit tenders for 4GT
8 October 1997	The initial closing date specified for the submission of tenders for 4GT by organisations which were pre-registered to tender
5 November 1997	The amended closing date for the submission of tenders for 4GT by organisations which were pre-registered to tender
22 January 1998	StateRail Board approves the initial order size be increased from 80 to 81 car to mitigate against the operational risk of collision damage to 1 car rendering an entire 4 car set inoperable

Date	Event
13 March 1998	The Interim Tender Evaluation Report recommends that one tender submitted be passed over while further clarification and negotiation be undertaken with the remaining two tenderers. The 4GT Executive Management Committee approved this proposal on 13 March 1998 and the StateRail Board was informed
25 June 1998	StateRail Board approves, subject to the successful outcome of final negotiations, Evans Deakin Limited trading as Clyde Engineering as the preferred proponent for the design, build and maintenance of the 4GT
29 June 1998	Budget Committee of Cabinet approves the 4GT project funding
30 June 1998	EDI Ltd announced as the preferred proponent for the design, build and maintenance of the 4GT, subject to the successful outcome of final negotiations
31 August 1998	Treasurer gives approval, under the Public Authorities (Financial Arrangements) Act 1987, for StateRail to enter into a contract for the purchase of the 4GT
8 October 1998	Contract for the design, build and maintenance of 81 4GT cars signed between StateRail and EDI Ltd. This is Stage 1 of the contract. At StateRail's sole discretion the contract allows further ordering of 60 4GT cars in each of Stages 2 and 3, that is up to 201 4GT cars
22 April 1999	StateRail Chief Executive Officer informs the 4GT Executive Management Committee (the project steering committee) that the train is to be referred to as the 'Millennium Train'
23 July 1999	EDI Rail, a subsidiary of EDI, briefs StateRail about proposed change in bogie design concept from dual air spring to a single air spring in order to achieve compliance with StateRail's specification requirements for the bogie
7 December 2000	Downer Pty Ltd makes announcement that EDI Board has recommended acceptance of Downer take over offer for EDI Ltd
8 December 2000	EDI Rail advises StateRail that communications and surveillance systems EDI Rail sub contractor has gone into receivership
25 March 2001	Premier announces that StateRail will acquire a further 60 Millennium Train cars, that is exercise the contract's Stage 2 purchase order option
22 May 2001	Minister for Transport writes to Secretary of the of Labor Council advising that future rollingstock purchases will be on the basis of a design and construct tender. This flowed from representation by the unions involved in the maintenance of rollingstock at StateRail
16 July 2001	EDI Rail formally submits a claim covering the design and build of Stage 1 of the Millennium Train, the 'Stage 1 Resolution Proposal'
15 September 2001	EDI Rail advises StateRail that bogie anti-roll bar EDI Rail sub contractor has gone into receivership
30 November 2001	First Millennium Train set (4 cars) arrives in Sydney from Newcastle. Commissioning tests of the train subsequently commences

Date	Event
4 March 2002	RIC advises StateRail that the Millennium Train exceeds electrical emissions specified for non interference with the network signalling system
25 June 2002	DoT and RIC formally accredit Millennium Train to operate on the Sydney suburban network
28 June 2002	StateRail issues practical notice of completion for 1 st set (4 cars) of the Millennium Train
30 June 2002	The Millennium Train is publicly (officially) launched
1 July 2002	First revenue service operation of the Millennium Train (4 cars)
18 November 2002	StateRail and EDI Rail sign a 'Deed of Release and Variation' in respect of the Millennium Train. As a result the estimated capital cost of the train and the project for all the Contract Stages increased significantly
29 November 2002	Practical completion of Set 4 was given which triggered acceptance of 8 car set operation
30 November 2002	First 8 car set Millennium Train enters revenue service
4 December 2002	First 8 car set Millennium Train peak hour revenue service
5 December 2002	StateRail orders another 60 Millennium Train cars from EDI Rail via the contract's Stage 2 purchase option being exercised/awarded
17 March 2003	The Minister for Transport announces in effect that the contract's Stage 3 purchase order option, another 60 Millennium Train cars, will proceed
10 April 2003	The Coordinator General of Rail takes the Millennium Train out of service until further prototype testing allows for technical issues surrounding the operations of the train that are impacting on its reliability to be resolved
2 June 2003	The gradual return to service of Millennium Train 4 car sets over a three week period commences with the first passenger non peak hour service being operated.

Appendix 3 StateRail Board Paper Meeting 1 November 2002

Strategic Procurement Plan for Rollingstock Extracts

Key Issues

StateRail historically purchases rollingstock in large tranches up to 15 years apart from a national passenger rollingstock industry which is extremely small by international standards.

The industry is fragile in that it has only 2 or 3 companies which can meet StateRail's needs.

Recent experience with the Millennium Train demonstrated difficulties in industry maintaining appropriate skills and knowledge to successfully develop and deliver new designs after relatively long periods of inactivity.

Each new train tends to be significantly different to previous designs and in some cases revolutionary rather than evolutionary.

There is no strategic plan for rollingstock procurement over the next 10-20 years which addresses the needs and constraints of both StateRail and the industry.

Proposal to Develop a Strategy

It is proposed that a 20 year strategic plan be prepared which addresses all relevant issues including:

- Demand;
- Market needs;
- Operating requirements;
- Life cycle costs including operation and maintenance;
- Re-use of existing rollingstock;
- Standardisation of components;
- Industry capacity;
- Procurement risk;
- Procurement options;
- Changing customer service requirements over time;
- Financing plan/options;
- Changing technology;
- Maintenance options;
- Workforce issues; and
- Infrastructure capacity.

Appendix 4 Assessment of Status and Progress Made on Tangara Performance Audit Report Recommendations

The Tangara audit report recommended that the future arrangements for major capital projects include the following changes in process and/or performance (features). Below is our short assessment of the status and progress made by StateRail on these matters in the Millennium Train project.

Recommendation	Support and Implementation Status	Comments
Allow for the administration of a contract through a project management team structure	Supported Fully implemented	A dedicated project management team was established for the Millennium Train.
Minimise the specification of particular components or design features where this is not necessary	Supported Partially implemented	StateRail's specification for the Millennium Train was very detailed for a performance based contract. As a result the Millennium Train was over specified and was not sufficiently performance based. Nevertheless, it was a notable improvement on the Tangara contract. Refer Section 3.3 <i>Compliance with Technical Requirements</i> for more detailed comments.
Clearly specify performance standards for complete units, and all major components	Supported Partially implemented	Performance standards specified in some instances were allegedly impossible to achieve, refer Section 3.2 <i>Delivery and Cost Achievements at Time of Our Review</i> for more detailed comments.
Have a reliable and agreed process for measuring performance of components in terms of the contract	Supported Fully Implemented	Reliable and agreed process for measuring performance was established.
Employ risk management techniques to deal with high risk factors such as the use of untested designs and technology	Supported Partially implemented	StateRail is aware of the need to effectively manage risks. However, the Millennium Train was not delivered on time nor within budget. Refer Sections 3.2 <i>Delivery and Cost Achievements at Time of Our Review</i> and 4.7 <i>Risk Management</i> for more detailed comments. Also StateRail does not currently have the "off the shelf" or standard train option and hence a lower risk profile. Refer Section 2.2 <i>Infrastructure and Purchasing</i> .

Recommendation	Support and Implementation Status	Comments
Employ design (“value-management”) reviews as an essential feature of the design process to reduce costs, minimise waste and maximise functionality	Supported Fully implemented	A value management study was undertaken and a report given in February 1996.
Employ effective arrangements to verify performance of service and control payments	Supported Partially implemented	There was extensive commission testing undertaken and payment is only made for each delivered 4 car Millennium Train set when StateRail is satisfied it has a ‘quality’ product. However, teething problems led to be train being withdrawn from service for further testing.
Monitor contractor inventory levels	Supported Fully Implemented	As payment was only made upon delivery of the Millennium Train set StateRail did not have to worry about this matter as it was of no interest to StateRail. However, a move back to milestone (progress) payments in future purchase contracts will probably necessitate monitoring occurring.
Deal with cost escalations in a simple, agreed manner	Supported Fully implemented now but not originally	Cost escalations were simplified compared to the Tangara. However, as part of the Deed of Release and Settlement executed between StateRail and EDI Rail on 18 November 2002 amendments were made to the contract schedules on the agreed application of the Contract to adjustments of the contract sum for escalation, foreign exchange fluctuations and custom duties.
Provide an effective, agreed approach to disputes resolution	Supported Fully implemented	An agreed approach to dispute resolution was laid down in the Millennium Train Contract. Also a dispute was settled without recourse to the Contract’s provisions, refer Section 3.2 <i>Delivery and Cost Achievements at Time of Our Review</i> for more detailed comments.

Recommendation	Support and Implementation Status	Comments
Deal with probity concerns in a proactive way	Supported Fully Implemented	A probity auditor was engaged and provided an unqualified opinion about probity, refer Section 4.6 <i>Conflict of Interest</i> for more detailed comments.
Involve internal audit at crucial stages and in on-going control reviews.	Supported Partially implemented	There has been limited internal audit involvement with the Millennium Train. They were aware of progress and undertook some work. However, more internal audit involvement is needed. Refer Section 4.3 <i>The Purchase Environment at StateRail</i> for more detailed comments.

Appendix 5 Response from Agencies

Response from the StateRail Authority

With reference to your letter of 13 May 2003, StateRail welcomes the opportunity to comment on the Performance Audit Report of the Millennium Train Project. The recommendations in the Report are supported in principle and this represents the direction StateRail is setting itself in the management of future rollingstock contracts.

Positive Results

StateRail has made many improvements to the procurement of new rollingstock since the purchase of Tangara. The Millennium Train is a technically complex train when compared to previous trains, but it is consistent with the technology being applied elsewhere in the world and in related industries. It is clear that the Millennium Train is a complex high value project that requires systems and processes to be well established to allow for its successful management. StateRail has put in place, with the Millennium Train Project, significant measures for dealing with such a technically complex and innovative project. Using the Tangara contract as one of many inputs a risk management process was integral to the set-up and management of the Millennium Train project.

The Tangara in the mid-1980's was the largest rollingstock purchase at that time. Following the review by the Auditor-General at the time, a number of recommendations were made. These were supported by StateRail and taken account of and adopted, where appropriate, in the Millennium Train project.

The main areas of success from the "lessons learnt" in the Tangara project are:

- The early establishment of a project management team structure;
- The establishment of a reliable and agreed process for measuring performance;
- The establishment of risk management techniques which involved all aspects of the Contract including the entry of the train into service;
- Establishment of a formal design review process;
- Extensive testing and commissioning program;
- Simplified payment and escalation system;
- A thorough tendering evaluation and tender reporting system.

The report also acknowledges the good value for money for the Millennium Train when compared to other Contracts in Australia and overseas.

Rollingstock Procurement

StateRail is continuing to examine its procurement methods for new rollingstock and plans to make further changes arising from experience with the Millennium Train Project and its upcoming need for replacement of a significant number of current rollingstock over the next 10 to 20 years.

StateRail historically purchases rollingstock in large tranches up to 15 years apart from a national passenger rollingstock industry which is extremely small by international standards. The industry is highly specialised and has only 2 to 3 companies which can meet StateRail's needs.

In order to capture the progressive industry safety and technology improvements, each new train tends to be significantly different to previous designs rather than being an evolutionary change. The current fleet strategy calls for procurement of approximately 50 cars per year, every year from 2007.

A 20-year strategic rollingstock procurement plan will be prepared which addresses all relevant issues including:

- Demand;
- Market needs;
- Operating requirements;
- Life cycle cost including operation and maintenance;
- Re-use of existing rollingstock;
- Standardisation of components;
- Industry capacity;
- Procurement risk;
- Procurement options;
- Changing customer service requirements over time;
- Financing plan / options;
- Changing technology;
- Maintenance options;
- Workforce issues; and
- Infrastructure capacity.

Summary

StateRail acknowledges that further improvements in a number of areas of rollingstock project management are appropriate, and hence, significant resources and time are being established and developed to progress to a new form of rollingstock procurement. This revised procurement method will build on from lessons learnt on both Millennium and Tangara and establish a process that provides greater certainty and better risk allocation for both StateRail and the rollingstock industry serving StateRail.

The Millennium Train project was clearly a significant step forward from Tangara. The Millennium Train project came some 10–15 years after the Tangara contract commenced, and required a high level of management of a technically complex train being delivered under a contract designed to address problems identified with the Tangara contract but a contract form not previously undertaken by StateRail.

StateRail is committed to a continuous improvement process for all such projects into the future and will use the recommendations from this report to further enhance its project management processes.

Attached are StateRail's comments on the recommendations in the Report.

(signed)
Fran McPherson
Acting Chief Executive
Dated: 5 June 2003

StateRail's Response to Recommendations

Recommendations	Supported/ Not Supported	Comment
<p>1. It is recommended that StateRail should:</p> <p>Explore the various purchasing options available for obtaining new trains and identify which option gives the best value for money.</p>	<p>Supported</p>	<p>StateRail is developing a long-term rollingstock procurement and contracting strategy to meet its rollingstock needs over the next 20 years, taking into account the limited number of suppliers in the Australian market place.</p>
<p>2. Continue to assess the benefits and risks of its train maintenance arrangements to ascertain with greater confidence which arrangements provide the best value for money.</p>	<p>Supported</p>	<p>The maintenance costs must be considered in the light of the nature and complexity of the equipment on the train and the performance levels required.</p> <p>StateRail notes the comments relating to in-sourced versus out-sourced maintenance. The issue will be subject to review on future contracts.</p>
<p>3. Further review the level of specification in performance based contracts occurring in train purchase tenders and contracts (an issue also with the Tangara).</p>	<p>Supported</p>	<p>StateRail will review future specifications to determine the correct balance between performance and detailed specification.</p>
<p>4. Ensure that the performance standards specified in contracts are appropriate (an issue also with the Tangara).</p>	<p>Supported</p>	<p>Specifications are developed based on previous contract requirements, appropriate standards and operational experience. StateRail will review the performance standards for suitability before inclusion in future contracts.</p>
<p>5. Review the adequacy of liquidated damages included in contracts and specify more clearly how and when liquidated damages will be applied in the event of the contractor failing to perform as specified.</p>	<p>Supported</p>	<p>The trigger for application of liquidated damages depends on the circumstances of the time. This will be reviewed to ensure that it is clear and appropriate to the performance of the Contractor and circumstances at that time.</p>

Recommendations	Supported/ Not Supported	Comment
6. Involve internal audit at crucial stages in major projects and in on-going risk management reviews (an issue also with the Tangara).	Supported	Internal audit was involved at crucial stages of the Millennium Train Contract and continues to be involved in major projects in StateRail.
7. Have a standard escrow arrangement for relevant intellectual property owned by the contractor included in all future major contracts.	Supported	Escrow arrangement are being implemented on current rollingstock contracts for new trains and StateRail plans to adopt a similar arrangement for the future rollingstock contracts.
8. Further avoid potential for perceived conflicts of interest in the use of probity advisers by limiting the use of the same advisers in other review work on the same project.	Supported	Potential Probity issues is a major assessment in every engagement of professional services. StateRail will ensure that this is clearly understood in any future evaluations with the review of the guidelines on the engagement of probity auditors.
9. More carefully assess the options for responding to risks as contractual provisions do not necessarily avoid and/or mitigate risk events to StateRail's business objectives.	Supported in principle	StateRail acknowledges the need for risks to be apportioned appropriately to the party that is most able to control the risks. Future contracts will reflect this aspect.
10. Be mindful of reputation risks that inappropriate marketing and communications can create with the public (passengers) and StateRail employees.	Supported in principle	StateRail reviews the appropriateness of marketing and communications at several stages before their implementation. StateRail will ensure that these risks are carefully reviewed in similar situations.

Response from the Rail Infrastructure Corporation

Thank you for the opportunity to comment on the Performance Audit of the Millennium Train project and, in particular, your 28 Day Report tabled the 13 May 2003.

In previous correspondence to your office dated 2 May 2003, RIC raised three issues. These issues were:

1. The Long-Term Strategic Plan with a Systems Approach
2. The Existing Capacity of the Electrical Network
3. Compatibility with the existing Signalling System

While there have been some minor changes, from the draft report to the final report, the previous comments from RIC are still considered pertinent.

With regard to the key findings in the report, the second dot point on page four, raises the issue of the opportunity to make fundamental revolutionary changes as distinct from incremental changes. While RIC would welcome the opportunity to undertake revolutionary changes, it also warns that all costs of these changes need to be considered before a decision is made to implement. Often a marginal cost for a particular subset of the system is considered, not the total cost of the system.

In the summary of recommendations on page six, the first dot point talks about the need for a 20-30 year strategic plan for the Sydney Rail Network. RIC, in conjunction with the State Rail Authority and the then Departments of Planning and Transport, have been working with other agencies to produce such a plan. It is agreed that with the restructure of planning in New South Wales, that the existing plan probably needs wider distribution within the community. This is undoubtedly an issue for the new Department of Infrastructure and Planning.

The Millennium Train has recently been returned to service and monitoring of the interface with the signalling system is continuing.

Thank you for the opportunity to provide input and to comment on the Performance Audit of the Millennium Train.

(signed)
Gary Seabury
Acting Chief Executive Officer
Dated: 3 June 2003

Response from the Department of Urban and Transport Planning

I refer to your letter concerning the draft Audit Report on the Millennium Train Project.

The Department has reviewed the draft report and has no comments on its content. The Department is continuing to prepare a revised long term plan for rail, in conjunction with the rail entities, as part of a broader approach to transport planning in Sydney.

As you may be aware, the Minister for Infrastructure and Planning and Minister for Natural Resources announced in the Parliament last week that the Department of Urban and Transport Planning and the Department for Sustainability and Natural Resources are to be merged to form a Department of Infrastructure, Planning and Natural Resources. This Department will legally come into being from 1 July 2003. It would be appropriate to change the name of the Department of Urban and Transport Planning to the Department of Infrastructure, Planning and Natural Resources throughout your report.

(signed)
Andrew Cappie-Wood
Deputy Director General
Dated: 4 June 2003

Response from the Transport Co-ordination Authority

Thankyou for the copy of your office's performance audit report on the Millennium Train included with your letter of 13 May 2003.

I note that extensive consultation has already taken place regarding the preparation of this report. Issues raised in the report that relate to this Authority have been considered and it is confirmed that there in no further response to be made to the 28 day report.

I thankyou for the opportunity to provide a formal response to the report contents.

(signed)
John Lee
Director General
Dated: 2 June 2003

Appendix 6 Acronyms

4GT	Fourth Generation Train, that is the Millennium Train
the Agreement	CityRail Service Agreement
the Campaign	Customer and Staff Information Campaign
the Contract	Deed of Agreement for the Millennium Train Contract between the Minister for Transport and EDI
the Deed	The Deed of Release and Variation
CBD	Sydney Central Business District
CTC	Competitive Tender and Contract
DoT	Department of Transport NSW
EDIL	Evans Deakin Industries Limited which subsequently became following takeover by Downer, Downer EDI
EDI Rail	The rail division of Evans Deakin Industries Limited and then subsequently Downer EDI following Downer's takeover of Evans Deakin Industries Limited and the new merged entity changing its name to Downer EDI
GST	Goods and Services Tax
ICAC	Independent Commission Against Corruption
IP	Intellectual Property
NSW	New South Wales
QLD	Queensland
RSA	Railway Services Authority/Rail Services Australia
RIC	Rail Infrastructure Corporation NSW
SA	South Australia
SRA	State Rail Authority of NSW
StateRail	State Rail Authority of NSW
VIC	Victoria
WA	Western Australia

**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 a 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, fieldwork 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/bpplist.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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Performance Audit Reports

No.	Agency or Issue Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
64*	Key Performance Indicators	<ul style="list-style-type: none"> ▪ <i>Government-wide Framework</i> ▪ <i>Defining and Measuring Performance (Better practice Principles)</i> ▪ <i>Legal Aid Commission Case Study</i> 	31 August 1999
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	<ul style="list-style-type: none"> ▪ <i>Administrative Procedures</i> ▪ <i>Protection of Intellectual Property</i> ▪ <i>Minimum Standard Checklists</i> ▪ <i>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

No.	Agency or Issue Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
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</i> <i>The Levying and Collection of Land Tax</i> <i>Coordination of Bushfire Fighting Activities</i>	20 June 2001
85*	Internal Financial Reporting	<i>Internal Financial Reporting</i> <i>including a Better Practice Guide</i>	27 June 2001
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

No.	Agency or Issue Examined	Title of Performance Audit Report or Publication	Date Tabled in Parliament or Published
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
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>	4 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>	June 2003

* 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 Governance and Communications Section on 9285 0155.



THE AUDIT OFFICE
OF NEW SOUTH WALES

**THE AUDIT OFFICE
MISSION**

Assisting Parliament improve
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performance of the State

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