

VICTORIA

Auditor-General
of Victoria

SPECIAL REPORT No. 59

AUTOMATING FARE COLLECTION

**A major initiative
in public transport**

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The President
The Speaker
Parliament House
Melbourne Vic. 3002

Sir

Under the provisions of section 16 of the *Audit Act* 1994, I transmit the Auditor-General's Special Report No. 59, "*Automating fare collection: A major initiative in public transport*".

Yours faithfully

C.A. BARAGWANATH
Auditor-General
November 1998

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Foreword

This Report documents the results of a performance audit of the development and implementation of an automated fare collection system for Melbourne's metropolitan public transport network. It deals with a major and complex project where virtually all tasks were outsourced by the Public Transport Corporation (PTC) under contract to OneLink, representing a private sector consortium.

The performance audit was substantially progressed within my Office by 30 June 1998. Under transitional provisions of the December 1997 amendments to the *Audit Act* 1994, I assigned the remaining field work for the audit to Audit Victoria, the new government statutory body established under the amended legislation. Members of the audit team transferred from my Office to Audit Victoria on 1 July 1998.

The Report identifies the recurring delays which have been experienced with the project and that final system commissioning, initially targeted under the contract to occur in February 1996, is still to eventuate. It provides further evidence of the risks associated with attempts to fast-track highly technical and complex projects, and that these risks are accentuated when responsibility for the bulk of development and implementation tasks rests with the one contractor. In this case, the combination of these 2 factors gave rise, over time, to numerous differences between the parties on the progressive status of system development. The differences became more pronounced as the extent of delays increased and a succession of revised commissioning targets passed without realisation.

As the Report points out, a strong feature of the contractual arrangements is the direct linking of remuneration to OneLink with achievement of commissioning milestones and performance standards. This approach has proved to be a major financial safeguard to the Government.

The PTC has indicated that it is not prepared to agree to final commissioning until it is completely satisfied that the totality of all equipment, components and information facilities are consistently operating in line with contractual requirements. This level of precision in assurance is vital for the new automated system where the integrity of fare revenue and production of accurate management information are so dependent on the system's faultless functioning. Such precision will also be necessary under the Government's privatisation plans for public transport in order to assist in providing a reliable basis for the allocation of revenue across multiple private operators.

There is no doubt that the many delays and difficulties experienced to date with the project have been costly in terms of both time and initial public confidence. While the community's familiarity with the automated system is gradually increasing, it is now crucial that successful implementation of the system across trains, trams and buses takes place without further delay. With this occurrence and widespread use of modern touchcard technology, fare collection within Melbourne's metropolitan public transport network could certainly be described as advanced by world standards.



C.A. BARAGWANATH
Auditor-General

Part 1

Executive summary

Part 1.1

Overall audit conclusion

1.1.1 During May 1994, following a public tender process, the Public Transport Corporation (PTC) entered into a contract with a consortium represented by OneLink Transit Systems Pty Ltd (OneLink) for the installation and operation of an automated fare collection system for metropolitan public transport at a total cost of around \$332 million. The contract is founded on a “*total management concept*” under which responsibility for virtually all aspects of fare collection is outsourced to OneLink. Accordingly, the PTC’s role under the arrangement is almost exclusively one of monitoring the extent to which contractual obligations are met by OneLink.

Problems with the fast-tracking of project management

1.1.2 In the Auditor-General’s November 1990 Report on the previous Met Ticket system, concerns were expressed with the insufficient emphasis given to ensuring a comprehensive feasibility study prior to introduction of that system and with the fast-tracking of project management practices during the development of the system. Despite the significant problems previously experienced with Met Ticket and raised with the Parliament in the previous Report, similar weaknesses were again distinctively evident with the new automated fare collection system.

1.1.3 An absence of a robust feasibility analysis of costs and benefits to support initial planning could be directly attributable to a decision recommended by the PTC and approved by the Government to “*fast-track*” system implementation. This decision was taken to address deficiencies in the earlier Met Ticket system and automate ticketing arrangements as soon as possible. The fast-tracking management strategy, coupled with the placing of virtually total reliance on OneLink for preparing detailed system specifications and managing all aspects of system development and implementation, exposed the Government to the major risk that the objectives of the system would not be achieved within the established timelines.

Major commissioning delays and impact on relationship between the parties

1.1.4 Against a background of some fundamental weaknesses in system planning, the history of the fare collection project has been predominantly one of a failure to meet a succession of revised commissioning targets. The commissioning of phase 1 of the project on 12 November 1997, essentially involving pilot implementation of the system across 10 per cent of the public transport network, represented a delay of almost 33 months from the initially agreed target of February 1995. Final commissioning of the system across the remainder of the transport network had still not eventuated at the date of preparation of this Report and was around 32 months behind the original contractual requirement of February 1996. The PTC advised audit that there were a number of issues yet to be resolved including ongoing concerns with the accuracy and completeness of management information generated under the system. Accordingly, the PTC indicated that it is not in a position to determine when final commissioning of the system would take place.

1.1.5 These successive delays arose in the initial stages from the fast-tracking of system development and the setting of milestones by the parties under the 1994 contract that, in hindsight, were unrealistic. It was as early as October 1994, just 5 months after signing of the contract, that the PTC expressed concern at the ability of OneLink to meet the agreed commissioning targets. However, as the project progressed, it became more and more evident that OneLink was experiencing ongoing problems in satisfying the PTC on system operational requirements. This environment led to a range of differences between the 2 parties on whether problems with the system had been satisfactorily resolved to enable phase 1 commissioning.

1.1.6 Given the level of disputation surrounding phase 1 commissioning, the parties sought independent expert determinations on 3 separate occasions in October 1996, November 1996 and May 1997. On all 3 occasions, the independent expert found in favour of the PTC in that OneLink had not fulfilled its contractual obligations to enable phase 1 commissioning to proceed.

1.1.7 Several amendments to the contractual rights and conditions have been agreed between the PTC and OneLink since 1994. Many of these amendments have reflected the desire of both parties to allow continuation of the project without recourse to action aimed at either pursuing progressive compensation or, ultimately, terminating the contract. It should be recognised, however, that the bulk of the changes subsequently incorporated into the contract would not have been necessary if major problems had not been experienced in meeting the key milestones agreed by the parties in the May 1994 contract.



1.1.8 Despite the recurring delays in system commissioning, the PTC was increasingly placed in a position of having little option but to proceed with the project due to:

- a need to continue to strive to comply with the Government’s decision to fast-track implementation of an automated system;
- the risk of lengthy and costly litigation that may have arisen from any action to terminate the contract with OneLink; and
- a growing realisation that termination of the arrangement would create the need to recommence development and implementation processes, which were already at an advanced stage, with an alternative supplier, with no guarantee that the involvement of a new contractor would not also lead to similar problems.

Financial provisions of contract

1.1.9 The contractual arrangements between the PTC and OneLink are essentially performance-based with payments to OneLink over the term of the agreement (8 years after final commissioning) dependent on the extent to which milestones and performance standards for the commissioning and ongoing operation of the fare system are achieved. This linking of payments to the achievement of commissioning milestones and performance standards has provided a major financial safeguard to the Government.

1.1.10 Payments to OneLink did not commence until November 1997 following phase 1 commissioning and, by the end of July 1998, OneLink had received around \$17 million for services provided under the contract. If both phases of commissioning had been achieved in line with the original target dates agreed in the 1994 contract, OneLink would have been eligible to receive additional payments of around \$90 million. In effect, OneLink has been required to finance the major portion of its operations for around 2 and a half years in excess of the period originally intended under the contract.

1.1.11 A major contractual amendment agreed to by the 2 parties allows OneLink to specifically claim additional payments for variations in the scope or specifications of the project up to a “cap” of \$30 million (or \$35 million if the PTC elects to enter an extended dispute resolution period). By agreeing to the introduction of a cap, the PTC has sought to limit its exposure to variation claims while retaining the right to contest any claims lodged by OneLink. With the creation of a cap of such magnitude, which audit views as excessive, the ultimate cost of the contract to the PTC could increase substantially if further significant variation claims, beyond those already submitted, are lodged by OneLink and ultimately deemed to be justified.

Public perception of system

1.1.12 With specialist assistance, audit undertook 2 market surveys of a representative sample of the general public, in May and August 1998, to ascertain the views of the community on the new system. A large percentage of respondents to both surveys, 48 per cent in August and 54 per cent in May, considered that introduction of the system had decreased the quality of service. Also, the level of users who reported in August 1998 that ticket vending machines were either always, frequently or sometimes broken down (46 per cent) or that validating machines were not working (37 per cent) should be of major concern for the PTC. It points to the need for the PTC to further investigate the frequency of equipment failures which may result in commuters not purchasing and validating tickets. Such occurrences can, as explained within this Report, significantly impact on PTC fare revenue.

Fare evasion - a key issue requiring attention

1.1.13 An increase in fare revenue from the curbing of fare evasion was a key outcome envisaged by the PTC from introduction of the fare system. However, the new system has created a major risk for the PTC in that there is potential for significant lost revenue from fare evasion, particularly in respect to tram travel. While the extent of fare evasion across the total public transport network cannot be accurately determined at this stage due to the absence of reliable information within the PTC, the greater risk of fare evasion on the tram system was illustrated in the market research undertaken by audit during August 1998. This research disclosed that 15 per cent of those respondents whose last journey was by tram had not purchased a ticket (the reasons for non-purchase were not sought in the market survey).

1.1.14 Based on the PTC's revenue estimates for tram travel during 1997-98 of \$52 million, if 15 per cent of tram commuters regularly failed to purchase tickets, there would be an annual revenue loss broadly equivalent to at least \$8 million, without taking into account other forms of fare evasion. For example, this figure does not include any fare evasion involving the 2 most popular ticket classes, namely, daily and 2 hour tickets. Any failure by commuters to validate these tickets allows them to be used unlawfully for multiple journeys until such time as validation occurs and a time restriction period is recognised by the system.

1.1.15 To date, the PTC has mainly emphasised an educational approach to its revenue protection activities in preference to fining fare evaders. It is likely that most transport users are now relatively experienced in the use of the system. Accordingly, the PTC will need to assess the desirability of continuing a focus on an educational role at the expense of targeting and penalising intentional fare evaders.

Future implications

1.1.16 Finally, several important matters arising from the new system and with direct implications for the Government's public transport privatisation program are currently under consideration by the PTC and the Department of Treasury and Finance. As an illustration, the system needs to have a capability to provide accurate management information to assist in the apportionment of fare revenue between various future private operators. These matters need to be satisfactorily resolved in order that potential bidders are fully conversant with the ramifications of the system for future business operations within a privatised public transport network.

1.1.17 In conclusion, after several years and many difficulties, final commissioning of the new system is still to eventuate. Throughout the process, the PTC has adopted a prudent approach to meeting its important responsibilities by withholding final commissioning until it is completely satisfied with the operational capability of all aspects of the system. It realises that any system defects which may arise in the future could be to the detriment of fare revenue, reliable management information and public confidence in the system.

1.1.18 Also, audit considers that, based on the experiences with this project, the Government should strongly re-assess the risks involved in entering into outsourcing arrangements under which total responsibility for all aspects of major and sophisticated technological projects, from design specification through to ultimate completion, rests with a single contractor. These risks are particularly accentuated when a fast-tracking management strategy is adopted.

1.1.19 When final commissioning eventually occurs, operation of the automated system will place Victorian public transport at the forefront internationally in terms of technologically-based fare collection systems. Successful implementation of the system should also strengthen the ability of the Government to plan future directions for public transport in Victoria.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC welcomes the report on the automated fare collection system and notes that it contains many reasonable observations, draws a number of valid conclusions and constitutes a comprehensive analysis of the system at a point in time. There are, however, a number of matters with which the PTC firmly refutes and wishes to place on record its opposing views. These are detailed below:

Fare Evasion

The PTC acknowledges that fare evasion on the public transport system is a problem which is being addressed. It is a problem, however, which has been considerably over-stated in the Auditor-General's Report. This overstatement is partly attributable to the Report's failure to recognise, in its criticisms of automatic ticketing, that fare evasion is not a product of automatic ticketing but was a substantial problem well before automated ticketing was undertaken, and partly due to the Report's failure to take into account the particular context in which its fare-evasion survey was conducted.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation - continued

The Report claims that a survey conducted by Audit Victoria in August 1998 revealed that 15% of respondents had not purchased a ticket on their last tram journey; this figure was arrived at by including non-validation of tickets on trams. The Report equated this percentage to an \$8 million per annum revenue loss. The survey however did not ask respondents their reasons for non-purchase – some may have had a pre-purchased ticket and some may have been travelling on concession (approximately 50% of public transport users are concessions holders), some may have been using other forms of tickets, that cannot be validated. Furthermore, non-validation of tickets does not necessarily indicate fare evasion. On the basis of this survey data, it is not possible to draw accurate conclusions about the extent of fare evasion, let alone attribute to it a dollar value.

The problem with a snapshot survey of the kind conducted by Audit, is that it produces data which is relevant only at a particular point in time. At the time of the August 1998 research, the automatic ticketing system was still at an early stage of introduction; since then, different ticketing options have been introduced and the number of retail outlets selling tickets has been expanded. Furthermore, the corporatised tram businesses are gradually developing their revenue protection strategy from one which focused primarily on customer education, which is appropriate to the initial stages of introduction, to one which is focusing increasingly on more stringent methods of revenue protection.

Fast-Tracking

The decision to fast-track the implementation of the automated ticketing system was taken in the context of the PTC’s desire to overcome the deficiencies of the existing system in a timely and effective fashion. Safeguards were put in place from the outset to ensure that fast-tracking did not expose the Government to excessive risk.

The report appears to confuse the decision to fast-track the implementation of the system with the decision to outsource the project. The decision to outsource the project enabled the PTC to limit its exposure to specifying the broad operational outputs required of the system (where it was on certain ground) and place the responsibility for detailed automatic ticket system specification (where the PTC had no expertise) with the contractor. Far from exposing itself to risk, as the Report claims, this strategy isolated the PTC from the costs associated with the system specification not meeting the operational requirements. As the report found, (Paragraph 5.10) “Overall the contract signed by the parties in May 1994 was very sound in protecting the interests of the Government”. The PTC has been vindicated in this approach.

Furthermore the strategy had the advantage of allowing the PTC to consider a range of alternative solutions, as opposed to having a tenderer who designed the specification being prevented from bidding for its implementation. In a field as narrow as automated ticketing the list of potential suppliers was already limited.

The PTC rejects the Report’s finding that OneLink’s inability to deliver all of the PTC’s requirements in a timely fashion is the result of functional specifications not having been developed prior to the signing of the contract. The evaluation team which selected OneLink was satisfied that OneLink met the tender specification. To have the signed the contract after the development of functional specifications could have passed the risk of any non-performance to the PTC and would not of itself have guaranteed that the specifications would meet the operational requirements. It would have negated the very strong contractual protection the PTC presently enjoys.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation - continued

The fast-tracking time-lines were contained within the original request for tender. At no time did any of the tenderers object to the time-lines stipulated in the request for tender.

Scope Variation

The PTC rejects the Report's clear implication that changes have been made to the original contract which have given OneLink a previously-withheld right to claim scope variations. This entitlement was always in the contract; the Collateral and following Supplemental Agreements simply established a process for submitting and assessing these claims. The Report similarly claims that in setting a "scope creep" limit of \$35 million, PTC has not only significantly amended the contract to its detriment, but is acknowledging the validity of claims up to this limit. PTC refutes the claim that in imposing a limit on scope variation, PTC has increased its risk on what was previously an infinite claim. In so doing, it has not in any way acknowledged that scope creep claims are valued at \$35 million.

The value and validity of scope variations is, and always has been, subject to PTC's agreement to system changes and not to changes required by the contractor to meet the specified output requirements of the system. The PTC will review the scope creep claim if and when presented, like any other claim, and it will only approve the claim if fully justified.

Revenue Allocation

In the Report, the Auditor General states his belief that it is critical that the automated ticketing system have the ability to "accurately apportion" revenue amongst the various corporatised, soon to be privatised, businesses. The Department of Treasury and Finance has developed an equitable and simply administered model of revenue allocation which is measured in terms of usage defined as boardings and passenger distance travelled, whereas the fare structure, for which the ticketing system was designed, is based on zones and time. The present fare system (and therefore the automated ticketing system) cannot of itself be used to apportion revenue directly as it is not based on the distance actually travelled. To proportion revenue would require a change to Melbourne's public transport fare structure.

The design of the automatic ticketing system was begun well before the decision to split the PTC into separate business units and to privatise those units, revenue apportionment between separate businesses was not a specified operational requirement. When the ticketing system is fully operational, however, much relevant data will be derived from this system rather than from surveys.



Part 1.2

Summary of major audit findings

SYSTEM PLANNING AND SELECTION OF PREFERRED CONTRACTOR

Page 33

- As part of its wide-ranging 1993 Public Transport Reform Program, the Government endorsed an earlier decision by the Public Transport Corporation (PTC) to introduce an automated fare collection system as a means of addressing perceived weaknesses in ticketing arrangements, including large-scale fare evasion.
Paras 4.9 to 4.18
- A decision to fast-track implementation of the new automated system and bypass many activities normally undertaken during initial planning, including conduct of a detailed feasibility study, increased the risk that the objectives of the system would not be achieved within established timelines.
Paras 4.19 to 4.29
- A sound framework was established by the PTC for the process of selecting a preferred contractor.
Paras 4.37 to 4.38
- While 2 of the 7 final reports prepared by the PTC's evaluation teams were not available for audit examination, audit gained some comfort from a view expressed in June 1994 by an independent consultant that the evaluation processes were "*appropriate and sufficient*".
Paras 4.39 to 4.42
- An overseas trip of 17 days by PTC officers to inspect sites operating similar systems took place a week after the signing of the contract with OneLink and was therefore considered by audit to be of no value to the evaluation process.
Paras 4.43 to 4.46
- Following the seeking of revised bids and the reduction by OneLink of its initial bid by \$89.1 million or around 20 per cent, the PTC nominated that OneLink be appointed as the preferred contractor.
Paras 4.47 to 4.52



SYSTEM PLANNING AND SELECTION OF PREFERRED CONTRACTOR - continued Page 33

- After having ranked OneLink last in terms of its ability to meet the PTC’s important information and reporting needs, the relevant evaluation team recommended this risk be minimised by having the detailed functional specifications developed prior to the signing of the contract. Due to fast-tracking of the system, this recommendation was not adopted and the subsequent inability of OneLink to fully satisfy the PTC’s requirements has largely vindicated the views expressed by the evaluation team.

Paras 4.53 to 4.56

- Although the decision to pursue a “build-own-operate” arrangement created the potential for major benefits, it also gave rise to a range of additional risks including an almost total reliance on OneLink for preparing detailed system specifications and subsequently designing and developing the system.

Paras 4.57 to 4.62

- Given the considerable risks involved when assigning all aspects of complex major contracts to the one contractor, the Government should consider a 2-phased approach under which the development of system specifications is satisfactorily completed before any action on remaining project tasks.

Paras 4.63 to 4.65

CONTRACTUAL ARRANGEMENTS FOR THE AUTOMATED SYSTEM

- Linking within the contract of remuneration to the achievement of commissioning milestones and performance standards has proved to be a major financial safeguard to the Government.

Paras 5.5 to 5.10

- The contract incorporates an extensive range of performance standards to assist the PTC in its monitoring of the progressive performance of OneLink.

Paras 5.11 to 5.12

- The relatively low level of potential bonus payments included in the contract provides minimal incentive for OneLink to perform above specified performance standards.

Paras 5.13 to 5.14

- A number of significant contractual amendments have been agreed between the PTC and OneLink since May 1994.

Paras 5.18 to 5.22

EXTENT OF PROGRESS IN COMMISSIONING THE AUTOMATED SYSTEM**Page 65**

- By October 1994, as early as 5 months after the signing of the contract, the PTC estimated that the project was already at least 3 months behind schedule and the agreed target date for phase 1 commissioning, February 1995, would not be achieved.
Para. 6.11
- The eventual commissioning of phase 1 on 12 November 1997 represented a delay of almost 33 months from the initially-agreed target date.
Paras 6.10 to 6.13
- Overall, the acceptance testing program adopted for phase 1 commissioning was rigorous. However, the level of retesting by OneLink of a sample selection only of areas which initially produced unsatisfactory results constituted the absolute minimum level required for the parties to be in a position to reasonably conclude that the automated system was operationally sound.
Paras 6.19 to 6.29
- Because of a high level of disputation on whether phase 1 commissioning obligations had been met, the 2 parties sought independent expert determinations on 3 separate occasions in October 1996, November 1996 and May 1997. On each occasion, the independent expert found in favour of the PTC.
Paras 6.30 to 6.34
- Despite the substantial delays experienced with phase 1 commissioning, the PTC did not at any stage seek to terminate the contractual arrangements, due to a mutual desire between the parties to progress implementation of the project and resolve any disputes at a later date.
Paras 6.35 to 6.36
- Notwithstanding the PTC's decision to approve phase 1 commissioning, a number of matters remained outstanding in relation to OneLink's performance and reporting obligations outlined in the contract and many still require resolution in order for final commissioning of the automated system to occur.
Paras 6.37 to 6.44
- At the date of preparation of this Report, final commissioning of the automated system had not eventuated and was some 32 months behind the original contractual target of February 1996, with a range of major matters still remaining unresolved.
Paras 6.45 to 6.51
- Payments to be made to OneLink over the period of the contract, subject to provision of satisfactory services and excluding potential bonuses to OneLink and compensation payments to the PTC, total around \$332 million.
Paras 6.61 to 6.65

EXTENT OF

PROGRESS IN COMMISSIONING THE AUTOMATED SYSTEM - *continued*

Page 65

- OneLink has received \$17 million up to 30 September 1998 for contractual services but would have been entitled to receive a total of \$107 million if both phases of commissioning had been achieved by the target dates agreed by the parties under the 1994 contract.
Paras 6.66 to 6.70
- By agreeing to the introduction in March 1997 of a variation claim cap of up to \$35 million for “*scope creep*”, the PTC has sought to limit its exposure while retaining the right to contest any claims lodged by OneLink. The established cap, which represents up to 42 per cent of the total capital equipment value of the automated system, was considered by audit to be excessive.
Paras 6.71 to 6.74
- While an assessment of the total value of variation claims likely to be submitted by OneLink cannot be made at this stage, the total cost to the PTC of the contract could extend by the value of the cap to around \$367 million, without taking into account any other variation claims agreed between the parties.
Paras 6.75 to 6.78

MONITORING THE PERFORMANCE OF THE AUTOMATED SYSTEM

Page 87

- At the date of preparation of this Report, the PTC had not given its approval to the performance reporting system developed by OneLink due to ongoing concerns about the integrity of the performance information generated by the automated system.
Paras 7.6 to 7.11
- Based on a March 1998 systems integrity review, the PTC concluded that significant effort was still required by OneLink in order to bring the quality of its transaction processing and performance reporting output up to the standard necessary to enable final commissioning.
Paras 7.13 to 7.16
- In reporting maintenance response times to the PTC, OneLink revealed that its performance had deteriorated from attending to in excess of 90 per cent of equipment calls within one hour in January 1998 to only 45 per cent of calls in July 1998.
Paras 7.28 to 7.35
- The June-July 1998 progress reports on performance submitted by OneLink to the PTC convey the contractor’s view, not yet accepted by the PTC, that all essential service obligation levels have been achieved and around 50 per cent of the higher-level approved performance standards have either been achieved or exceeded.
Paras 7.36 to 7.37

PUBLIC IMAGE OF THE AUTOMATED SYSTEM**Page 97**

- It was not until 1997, or 3 years after signing of the contract, that the PTC obtained a comprehensive plan from OneLink which included specific marketing objectives and strategies.
Paras 8.29 to 8.35
- The April 1998 market research undertaken by the PTC provided an early indication to both the PTC and OneLink of the need to reassess marketing and education strategies if public acceptance of the automated system was to be ultimately achieved.
Paras 8.37 to 8.39
- Based on the results of 2 audit surveys, a relatively high level of users are unaware or unsatisfied with information available on the automated system which raises some concern over the effectiveness of material distributed through public education campaigns.
Paras 8.42 to 8.51
- The level of users who reported that ticket vending machines were either always, frequently or sometimes broken down (46 per cent) or that validating machines were not working (37 per cent) is a major concern for the PTC, particularly as revenue can be forgone if commuters are unable to purchase or validate tickets.
Paras 8.56 to 8.60
- Keeping one's physical balance while using ticket vending and validation machines on trams is viewed as a major problem for older age travellers and indicates that further steps are necessary to minimise the risk of injury to passengers.
Paras 8.61 to 8.62
- A majority of users perceived that the introduction of the automated system had resulted in a lowering of the quality of public transport, although an increasing number of respondents had noticed improvement in service.
Paras 8.68 to 8.70
- Analysis of the reasons for dissatisfaction with the public transport system revealed safety and security were the primary concerns of public transport users.
Paras 8.71 to 8.73
- The fact that 18 per cent of users considered they were less likely to use public transport since introduction of the automated system warrants attention by the PTC.
Paras 8.74 to 8.75



PUBLIC IMAGE OF THE AUTOMATED SYSTEM - continued

- Over one in 3 transport users advised they held a concession card with a very high rate of concession holders among those aged 65 and over.

Para. 8.76
- Discussions and focus group interviews held by audit in June 1998 with various user organisations identified a range of concerns with the automated system including the continuing unavailability of touchcards and a perceived lack of security and assistance for elderly and disabled commuters.

Paras 8.77 to 8.80
- Early implementation of June 1998 recommendations made by a ministerial working party would satisfy many of the concerns identified by special user groups and could lead to increased patronage of public transport.

Paras 8.81 to 8.83
- Tourism agencies expressed disappointment with the lack of consultation by the PTC prior to the implementation of the automated system.

Paras 8.84 to 8.88

IMPLICATIONS OF THE AUTOMATED SYSTEM ON FUTURE OPERATIONS OF PUBLIC TRANSPORT

- Because of a delay in establishing a retail agency network, the buying patterns of commuters have become entrenched and the PTC's objective of having at least 90 per cent of tram and bus ticket sales derived from off-vehicle purchases is unlikely to be achieved in the near future.

Paras 9.13 to 9.23
- The majority of respondents to the audit surveys were not aware of the ticket home delivery service introduced in February 1997 and use of the service by those who had knowledge of the facility was exceptionally low (just one per cent in August 1998).

Paras 9.27 to 9.30
- The virtual stagnation of fare revenue levels in 1997-98 indicates there is an urgent need for the PTC to establish the underlying reasons for this occurrence, including whether the introduction of the new automated system has been a significant contributing factor.

Paras 9.31 to 9.37

.....

**IMPLICATIONS OF THE AUTOMATED SYSTEM
ON FUTURE OPERATIONS OF PUBLIC TRANSPORT - *continued***

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- While the new automated system has given rise to a mixture of controls and risks in relation to the important question of fare evasion, the major risk confronting the PTC involves the potential for significant lost revenue from fare evasion in respect to tram travel.
Paras 9.38 to 9.47
- The PTC will need to assess the relevance of continuing a sole focus on educating public transport users who travel without a valid ticket at the expense of targeting and penalising intentional fare evaders.
Paras 9.48 to 9.50
- A key priority for the PTC should be to establish mechanisms for accurately determining the magnitude of fare evasion and to formulate strategies under which fare evasion can be reduced to tolerable levels.
Para. 9.51
- Ensuring the validation of tickets by all public transport users is a major challenge facing the PTC given that the process of validation represents a fundamental change from previous ticketing arrangements.
Paras 9.52 to 9.58
- OneLink's Year 2000 compliance program is not scheduled to be fully completed until as late as September 1999 even though certain tickets sold from January 1999 will have an expiry date with the year 2000.
Paras 9.59 to 9.63
- Several important matters arising from the new automated system with direct implications for the Government's privatisation plans for public transport are currently under consideration by the PTC and the Department of Treasury and Finance.
Paras 9.64 to 9.71

Part 2

Background to the automated fare collection system



2.1 The Victorian Public Transport Corporation (PTC) is a statutory organisation responsible for the operation of trains and trams in the Melbourne metropolitan area, and for both passenger and freight services in rural Victoria. Under the *Transport Act 1983*, the Department of Infrastructure contracts the PTC to provide these services in line with the overall legislative obligation to “... *efficiently manage and provide a safe and reliable public transport system in Victoria that has due recognition for the needs and interests of the users of that system and the taxpayers of Victoria*”.

2.2 The operation of an appropriate fare collection system can be seen as having a direct impact on the ability of the PTC to meet this overall objective in terms of:

- the reliability of the system;
- meeting the needs and interests of public transport users; and
- ensuring the efficiency of collection processes and subsequently contributing to minimising the public transport subsidy from taxpayers.

2.3 The use of an automated system, with an accompanying lower reliance on staffing of the transport system, can also have secondary impacts on service and safety issues (involving the needs of special user groups) associated with the use of public transport.

DECISION TO IMPLEMENT AN AUTOMATED FARE COLLECTION SYSTEM

2.4 Historically, fare collection for Victorian public transport has been labour-intensive with heavy reliance on conductors on trams, rail station staff and bus drivers to collect fares from passengers. With this approach, a substantial proportion of the PTC’s annual expenditure has related to the employment of staff directly involved in fare collection and revenue protection activities.

2.5 In January 1993, the Government commenced a wide-ranging public transport reform program. Implementation of this program was addressed in detail in the Auditor-General’s May 1998 Special Report No. 57 entitled *Public transport reforms: Moving from a system to a service*, tabled in Parliament in May 1998. The program was directed towards both ensuring the long-term viability of Victoria’s public transport and transforming the public transport system into a service that is responsive to the needs of its customers. These aims were to be achieved through a range of initiatives including major changes to the traditional fare collection methods.

2.6 As part of the reform program, the Government outlined its view that existing public transport ticketing arrangements were slow, labour-intensive and provided insufficient information to facilitate effective management of the transport system. The extent of fare evasion, estimated by the PTC at that time to cost between \$10 million and \$30 million each year, was also recognised as a major impediment to the PTC in improving its financial performance.

2.7 To address the above circumstances, the Government determined to implement an automated fare collection system as a matter of priority. Introduction of the system was expected to result in major cost-savings through the introduction of driver-only operation of trains and trams, and the reduction of staff associated with revenue collection activities such as tram conductors.

OUTSOURCING OF RESPONSIBILITY FOR THE AUTOMATED SYSTEM

2.8 In May 1994, following a public tender process, the PTC entered into a contract with OneLink Transit Systems Pty Ltd (OneLink) for the installation and operation of an automated fare collection system (now known as Metcard) at a total cost of around \$332 million.

2.9 The 1994 contract provided for a “*total management concept*” whereby responsibility for virtually all aspects of fare collection was outsourced to OneLink. These aspects included not only the design and installation of an automated fare collection system throughout the Melbourne metropolitan public transport network but also ongoing operation of this system and supporting activities such as the establishment and management of a retail ticketing agency network and a public education program associated with the changes to ticketing arrangements.

2.10 Given the extensive outsourcing involved, the arrangement is essentially based on achievement by OneLink of milestones, performance standards and essential service obligations during the development, installation and ongoing operation of the system.

2.11 Accordingly, the PTC’s role under the arrangement is almost exclusively one of monitoring the extent to which contract conditions, including performance standards, are achieved by OneLink. The PTC therefore has limited scope for direct involvement in system development, implementation or operation.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

It should be stressed that the PTC’s involvement in the system development related to establishing the performance standards and other system output requirements which form the basis for system development.

COMPLEXITY OF THE AUTOMATED SYSTEM

2.12 At the time of entering into arrangements with OneLink, the task of implementing an automated fare collection system on the Melbourne metropolitan public transport network was innovative and technically complex by world standards. In October 1997, consultants commissioned by the PTC to review progress of the project referred to the system in the following terms:

“In the Government’s drive to increase efficiency, PTC embarked on one of the most innovative programs in the world for AT [automated ticketing]”.



- 2.13** In making this comment, the consultants referred to the following factors:
- *“first attempt by a public transport agency to fully outsource fare collection;*
 - *first contract that finances the ATS [Automated Ticketing System] through service fees;*
 - *first contract that costs the agency \$0 until pilot stage of the ATS is fully operational; and*
 - *PTC’s ATS requirements were the most complex in the world when the contract was tendered in 1993” .*

- 2.14** The technical complexity of the project resulted from the wide range of operational requirements of the system including:
- the multi-modal nature of the Victorian transport network with the fare collection system to be installed in railway stations and on trams and buses;
 - a need for revenue from the common fare system to be distributed equitably to multiple transport operators (who in the future are likely to be private companies);
 - the 2 types of ticket media proposed in the contract, namely, magnetic card tickets and touch cards (the latter type of ticket is currently being tested);
 - the technically-complex software and equipment required to:
 - provide not only ticket sale facilities but also extensive on-line management information on the travel patterns of users and performance of system components; and
 - connect a central processing unit to the various ticket machines and remote computer terminals located throughout the transport network;
 - the large amount of equipment to be installed including ticket machines (some incorporating both cash and EFTPOS facilities), validation machines and ticket barriers; and
 - the large volume of financial and other transactions to be processed through the system given that, on average, commuters undertake around 900 000 public transport journeys each day.

2.15 The implementation of the automated system represented an extremely complex project which, if successful, would establish Victorian public transport at the forefront internationally in terms of technologically-based fare collection systems.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC questions the references here and elsewhere in the report to the system’s unique, technically complex and multi modal features. All features of the system that were specified in the Request for Tender were in operation in public transport systems in Australia and/or overseas. The Request for Tender emphasised the requirement for proven equipment, components and computer systems.

The Melbourne system is not unusually large in terms of financial and other transactions when compared with, for example, the Hong Kong system in which approximately 10 million public transport journeys are undertaken each day.

OPERATIONAL FEATURES OF THE AUTOMATED SYSTEM

2.16 Although final commissioning of the system is yet to be achieved, the fare collection system has been progressively implemented throughout the Melbourne metropolitan public transport network over the last 12 months.

2.17 The majority of Victorian public transport users would, by now, be aware of the “public face” of the system comprising:

- ticket and validation machines located at rail stations and on trams and buses; and barriers located at larger metropolitan rail stations requiring validation of tickets to enter or leave the station.



Barriers in operation at Flinders Street Station.

2.18 Public transport users are likely to be less aware of the detailed recording and processing of information that is triggered each time a ticket or validation machine is used.



2.19 As previously referred to, a key factor in the decision to implement an automated system was the potential for significant improvements to the volume and quality of management information concerning public transport usage in areas such as:

- details of each ticket purchased through the system in relation to type of ticket and point of purchase;
- the number of individual trips for which 2 hour, daily or longer-term tickets are used (this information is highly dependent on users validating tickets each time a public transport vehicle is boarded); and
- the performance of the system, for example, the recording of equipment faults, which is vital for measuring the extent to which the system is achieving required operating standards.

2.20 Management information of this nature is processed and analysed on a central computer system maintained by OneLink. A range of systems and equipment is used to collect and feed up-to-date information back to this central system including:

- computer systems located at rail stations which control the operation of ticket and validation machines and are on-line to the central computer system;
- driver key pads on trams and buses used to gather information during journeys from ticket and validation machines (ticket and validation machines on trams and buses are not directly linked to the central computer system); and
- portable memory equipment, used at the beginning and end of driver shifts, to transfer information from the equipment on trams and buses to depot computer systems which are on-line to the central computer system.

2.21 Table 2A sets out the main types of equipment and the principal systems utilised within the automated fare collection system.

**TABLE 2A
MAJOR EQUIPMENT AND SYSTEMS USED IN
THE AUTOMATED FARE COLLECTION SYSTEM**

<i>Equipment and systems</i>	<i>Purpose and other information</i>
Ticket vending machines	Provide the facility for the purchase of tickets on rail stations and on trams. Ticket vending machine no. 1 also at rail stations has a smaller range of tickets and accepts coins only. Ticket vending machine no. 2 located at rail stations includes a full range of tickets and other options such as the ability to accept coins, notes and EFTPOS. Ticket vending machine no. 3 located on trams are coin-operated only and offer only 2 hour and short trip tickets.
Ticket issuing machines	Used on buses for the issue of tickets and to monitor the operation of other bus equipment such as validators.
Booking office machines	Located in rail station booking offices to enable sale of tickets by station staff.
Validation machines	Located at stations and on trams and buses. Used to check that tickets are valid for the journey and records details of the trip for management information purposes.



TABLE 2A
MAJOR EQUIPMENT AND SYSTEMS USED IN
THE AUTOMATED FARE COLLECTION SYSTEM - *continued*

<i>Equipment and systems</i>	<i>Purpose and other information</i>
Tram driver key pad	Used on trams to gather trip and ticket sales information and to monitor the operation of ticket machines and validators.
Portable memory and memory readers	As fare collection equipment on trams and buses is not directly linked to the central computer system, portable memory and associated readers are used to transfer ticketing information between depot computer systems and equipment located on the vehicle.
Portable ticket readers	Used by customer service officers to check the validity of tickets held by public transport passengers.
Barriers	At major rail stations, barriers incorporate a built-in validator which prevents entry or exit to the station without a valid ticket.
Metcard	Magnetic strip-based ticket issued from ticket machines which records details such as the time ticket purchased and whether the ticket is valid.
Metcard Express	Rechargeable touch card ticket to be introduced for long-term tickets and for users with special needs. Currently still in the development and testing phase.
Central computer system	This system records all information transferred from other system equipment and produces management and financial information on ticket sales and the operation of system components located throughout the public transport network.
Station control system and depot computer system	Computer systems within stations and bus and tram depots directly linked to, and used to update information on, the central computer system.
Performance reporting system	System developed by OneLink to report actual performance of the fare collection system against performance standards and obligations included in the contract with the PTC.

2.22 The potential clearly exists for extensive management information to be generated from the fare collection system and for this information to be used as the basis for monitoring by the PTC of patterns of usage of public transport and future planning of expansion or changes to the transport network. The value of such information for important decision-making in the future will be highly dependent on the reliability of the data recorded and processed, a key matter identified within this Report as requiring resolution prior to final commissioning of the system.

Part 3

Conduct of the audit



DECISION TO CONDUCT THE PERFORMANCE AUDIT

3.1 Because of the significance of the Government’s decision to introduce an automated fare collection system to the Melbourne metropolitan public transport system, the Auditor-General has progressively monitored development of the automated system since the awarding of the contract to OneLink in 1994. Relevant comments have been conveyed to the Parliament in various Auditor-General’s *Reports on the Government’s Annual Financial Statement and Reports on Ministerial Portfolios*. These Reports have largely concentrated on financial matters and have not included detailed comment on the implementation of the system.

3.2 The Auditor-General’s May 1998 Special Report No. 57, entitled *Public Transport Reforms: Moving from a system to a service*, outlined the results of a performance audit of the progressive implementation of the Government’s transport reform program. That Report specifically excluded detailed comment on the automated system on the basis that the importance of the system warranted detailed consideration in a separate performance audit.

3.3 Finally, the decision to undertake a performance audit dealing specifically with the automated system was endorsed by the Parliament’s Public Accounts and Estimates Committee following consultation with the Committee by the Auditor-General on annual performance audit planning, as required by the *Audit Act* 1994.

AUDIT OBJECTIVE

3.4 The overall objective of the audit was to evaluate the efficiency and effectiveness of implementation of the automated fare collection system by the PTC. In pursuit of this overall objective, audit directed emphasis towards determining whether:

- the decision to implement the automated system was appropriately justified and consistent with relevant government and PTC policies;
- outsourcing arrangements were transparent and equitable;
- the development and implementation of the system were efficiently and effectively planned and managed; and
- expected outcomes from introduction of the system had been progressively achieved.

3.5 The audit also sought to give visibility and recognition to initiatives taken by the PTC to progressively achieve greater effectiveness in its monitoring of the automated system contract and to improve the quality of service provided to public transport users.



AUDIT SCOPE

3.6 To achieve the audit objective outlined above, the scope of the audit included examination of:

- the extent and nature of evaluation and analysis undertaken by the PTC prior to approval of the automated fare collection system project;
- processes established to manage the design, commissioning and operation phases of the project;
- the outsourcing of the development and operation of the automated system including selection processes, contractual arrangements and mechanisms established for ongoing monitoring of contractor performance;
- the impact of the project on achievement of the Government’s broad policy objectives particularly those outlined under the transport reform program;
- community and other consultative processes employed by the PTC; and
- the extent to which time, financial and quality targets of the project have been achieved to date.

3.7 The audit also involved:

- examination of key documentation held by the PTC;
- discussions with management and staff of the PTC, the Department of Treasury and Finance, the Department of Infrastructure and the contractor, OneLink Transit Systems Pty Ltd;
- observation of the operation of the automated system;
- 2 market surveys of public transport users; and
- consultation with representatives of the Public Transport Users’ Association, the Public Transport Union and various community organisations.

RESOURCING OF THE AUDIT

3.8 Important amendments to the *Audit Act* 1994, which impacted on the resourcing of this performance audit, were passed by the Parliament in December 1997. These amendments arose from the Government’s review of the audit legislation under the National Competition Policy.

3.9 As a consequence of the legislative changes, the Auditor-General is required to appoint “authorised persons”, following a process of contestability, to assist in the carrying out of both financial and performance audits. A new government statutory body, Audit Victoria, initially staffed by personnel transferred from the Victorian Auditor-General’s Office and operating under a Board of Directors appointed by the Government, was established within the legislation to participate in this contestability process along with private sector service providers.

3.10 While external contractors must now be engaged by the Auditor-General to conduct field audit work, the Auditor-General remains solely responsible to the Parliament for the quality of the final audit product.



3.11 The contestability regime for the Auditor-General’s audit responsibilities is to be progressively implemented. For performance audits in progress, the amended legislation provided the Auditor-General with the option of utilising the Victorian Auditor-General’s Office to continue to conduct the audits or assigning remaining tasks to Audit Victoria. In this regard, the Auditor-General determined to appoint Audit Victoria to complete the remaining field tasks for this particular audit and prepare an audit report which would be considered for presentation to the Parliament.

3.12 Audit Victoria’s formal involvement in the audit commenced on 1 July 1998 following the transfer to that organisation of members of the audit team who were previously employed within the Victorian Auditor-General’s Office.

SPECIALIST ASSISTANCE UTILISED BY AUDIT

3.13 During the audit, specialist assistance was utilised in the following areas:

- conduct of 2 market surveys of public transport users by Quadrant Research Services Pty Ltd, market research specialists; and
- advice from Bovis McLachlan Pty Ltd, management consultants, on various aspects of the contractual arrangements entered into by the PTC relating to the automated fare collection system.

ASSISTANCE PROVIDED TO AUDIT BY THE PTC AND OTHER PARTIES

3.14 Significant support and assistance was provided to audit by the management and staff of the Public Transport Corporation. Audit wishes to acknowledge the contribution that this assistance made to the preparation of material for this Report.

3.15 Audit also wishes to express its appreciation for assistance provided by the following organisations and groups:

- Department of Treasury and Finance;
- Department of Infrastructure;
- Public Transport Users’ Association;
- Public Transport Union;
- Accessible Transport Consultative Council;
- Association for the Blind;
- The Arthritis Foundation;
- City of Melbourne Visitor Services;
- Combined Pensioners Association of Victoria;
- Council on the Ageing;
- Guide Dog Association of Victoria;
- Melbourne Convention and Marketing Bureau;
- National Federation of Blind Citizens of Australia;



- Older Persons Action Centre;
- Paraplegic and Quadriplegic Association;
- Royal Victorian Institute for the Blind;
- Spastic Society of Victoria; and
- Yooralla Society of Victoria.

3.16 Finally, appreciation is also expressed to those members of the general public who participated in the surveys of public transport users, provided submissions on their experiences with the fare system or otherwise contributed to the audit.

Part 4

System planning and selection of preferred contractor

OVERVIEW

4.1 Based on international practice and previous Public Transport Corporation (PTC) reviews of ticketing options, the concept of an automated fare collection system for Victoria’s public transport system was sound. However, the transition of advanced automation of the envisaged automated system from a concept to an effective practical reality would necessitate careful project and contractual management, particularly at the design and contract specification stages.

4.2 In the Auditor-General’s November 1990 Report on the previous Met Ticket system, concerns were expressed with the insufficient emphasis given to ensuring a comprehensive feasibility study prior to the introduction of that system and with the fast-tracking of project management practices during the development of the system. Despite the previous problems with Met Ticket, a formal feasibility study was not undertaken for the new automated system. In audit opinion, the lack of time devoted to a formal evaluative study incorporating a robust analysis of costs and benefits and adequate community consultation increased the likelihood that problems would arise during the subsequent implementation of an automated system which was unique to Victoria.

4.3 The major reason for the lack of a detailed feasibility study was a decision recommended by the PTC and approved by the Government to “*fast-track*” system implementation in order to address deficiencies in the earlier Met Ticket system and implement more effective ticketing arrangements as soon as possible. This decision resulted in the bypassing of many activities normally undertaken during the initial planning phase of such a project and created for the Government far greater exposure to the risk that the objectives of the automated system would not be achieved within the established timelines.

4.4 Following a selection process, OneLink Transit Systems Pty Ltd (OneLink) was appointed in 1993 to design, develop, implement and manage the automated system under a “*build-own-operate*” outsourcing arrangement. As all 3 tenderers were considered to have the technical capability to undertake a project of this nature, the ability of OneLink to reduce its initial bid by \$89.1 million or around 20 per cent was the deciding factor in its appointment as the preferred contractor.

4.5 The decision to outsource all aspects of system development and implementation under one contractual arrangement provided the potential for significant benefits and enabled the Government’s preferred fast-track approach to be pursued. However, an arrangement of this nature also gave rise to a range of additional risks. In particular, the decision to rely on the contractor to prepare detailed specifications to meet the broad outcomes required by the PTC was key to the subsequent success or otherwise of the project.



OVERVIEW - continued

4.6 Given the complexity of the project and the associated risks involved, consideration should have been given to adopting a 2-phased approach to outsourcing under which:

- detailed specifications and requirements were tendered for and prepared by a contractor under an initial arrangement; and
- a further arrangement for development, implementation and operation of the automated system in line with these specifications was entered into with the same or another contractor but only after successful completion of the specification phase.

4.7 Such an approach would have allowed more exhaustive evaluation of the extent to which proposals for system development submitted by potential contractors would comply with detailed specifications and facilitate assessment of the appropriateness of proposed installation milestones prior to the long-term commitment to one contractor for managing all aspects of the automated system.

4.8 In terms of lessons to be learned from this project, the Government should consider the adoption of a 2-phased approach in any future outsourcing arrangements involving technically complex systems or processes.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The methodology adopted by the PTC incorporated a number of protections to the PTC which were considered necessary in a fast track project of this nature. Firstly the request for tender sought alternative solutions for the requirements of the PTC, secondly the decision to outsource fully the project placed the project risk with the contractor and, thirdly, the incorporation of a phase one Commissioning concept was used to ensure that there was a “test” system against which the specifications etc could be assessed. In essence Phase One Commissioning was a process by which detailed specifications were to be tested in the field prior to the full system rollout.

All tenderers were given the opportunity to resubmit their bids. It is PTC’s understanding that the reduction of OneLink’s price was due predominantly to compliance with tender requirements especially in regard to operating requirements. Their initial offer had exceeded the specifications. The tender process and the selection of the successful tender was validated by the probity auditor.

The decision to rely on a contractor to prepare the detailed specifications to meet the broader operating requirements of the PTC placed the risk for the adequacy of these specifications with the contractor and not the PTC. The PTC believes this decision has been vindicated in that it has been financially protected from the effects of the failure to achieve project milestones.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation - continued

The PTC believes that the adoption of a two phased approach to outsourcing has the potential to expose the government to increased risk. Firstly, a contractor will develop specifications which reflect its particular experience and solutions. This will deny the Government the opportunity to consider alternative solutions. Secondly the Government will then assume the “specification“ risk when the specification is finalised. Should this specification not deliver the desired outcomes, Government would bear the risk.

PTC believes that this option compares unfavourably with the risks associated with inadequately defining the outputs required when the PTC is well experienced in its operational requirements. It is also the PTC’s understanding that Government policy, and previous Auditor General reports, strongly discourage a process whereby an external tenderer who develops a system specification is then invited to bid for that specification. Finally, the limited number of potential suppliers would have been further restricted by denying one of the contractors the ability to bid for specifications it had prepared. This would have rendered the PTC only able to choose from two potential contractors for this project.

PTC believes that a significant lesson that has been learned from the project is that outsourcing and risk transfer can be achieved with limited risk to the government.

DEVELOPMENT OF THE CONCEPT FOR AN AUTOMATED SYSTEM

4.9 Internationally, over the last 2 decades, the use of automated techniques for fare collection on public transport systems has become common with the level of automation varying from relatively simple ticket machines and token-activated barrier systems to, in more recent times, the use of smart card technology.

4.10 In Victoria, until the decision to develop and implement a new automated system, there had been virtually no use of automation in the collection of fares on public transport. Instead, continual reliance was placed on more labour-intensive fare collection methods such as the employment of conductors on trams and of staff at rail stations.

4.11 The question of reforming these traditional methods of fare collection has been under consideration by Victorian Governments since the early 1970s. However, it was not until the late 1980s that the first major changes to ticketing systems were undertaken but, as explained below, these initial steps did not involve automation.

4.12 As part of a 1989 reform program, the then Government decided to introduce Met Tickets (which became commonly known as “scratch” tickets) to be sold on public transport and through a network of retail outlets. This decision was aimed, at least partially, at changing passenger behaviour from that of ticket purchasing on the transport system to the pre-purchase of tickets off-system through the retail outlets. It was envisaged that annual savings of up to \$24 million could be achieved through the introduction of driver-only trams (i.e. trams without conductors) and a reduction in the number of rail station staff involved in ticket selling and checking.



4.13 Several significant problems were subsequently experienced with the implementation and operation of the Met Ticket arrangements. These problems were addressed in the Auditor-General's November 1990 Special Report No. 15 entitled *Met Ticket*.

4.14 In reaction to the difficulties encountered with Met Ticket, the then Minister for Transport established a Met Ticketing Task Force, an independent group which did not include representation from the Public Transport Corporation. This Task Force was required to advise on new ticketing options with particular emphasis on public transport user requirements and suitable technical solutions. In its May 1991 report, the Task Force concluded that the most appropriate option for fare collection was the introduction of an automatic ticketing system, supported by a retail network, and accompanied by the retention of daily tickets, station staff and tram conductors.

4.15 While the PTC did not fully support all conclusions of the Task Force (such as the retention of tram conductors), the recommendation for an automated system was accepted.

4.16 As part of its wide-ranging 1993 Public Transport Reform Program, the Government endorsed the earlier decision to introduce an automated system. The reform program was specifically designed to reduce the long term costs of public transport through the implementation of a range of initiatives across the whole transport network. In particular, the Government considered that existing ticketing arrangements were slow, labour-intensive and provided insufficient information to facilitate transport planning and management. It also cited large-scale fare evasion and full-time staffing of low patronage railway stations as major impediments to improving the financial performance of the PTC. The introduction of an automated fare collection system and driver-only operation of trains and trams was envisaged as the most effective means of addressing these issues.

4.17 Having regard to international practice and previous reviews of ticketing options undertaken by the PTC, the concept of introduction of an automated fare collection system to Victoria's public transport system was sound. However, based on the earlier experiences with the Met Ticket project, it should have been clear to all parties that success of the more sophisticated changes to the system arising from an automated ticketing structure would be dependent on the effectiveness of key planning and design functions. In addition, the following factors relevant to the Victorian context would require careful attention:

- the technical complexity of the proposed automated system and its specialised management information requirements;
- the multi-modal nature of Victorian public transport;
- the proposal to fully outsource all major facets of the fare collection process;
- the previous absence of any form of automation and the associated need for significant cultural change by public transport users; and
- the impact of ceasing the additional roles traditionally performed by fare collection staff such as assisting customers and an involvement in revenue protection.

4.18 In short, the transition of advanced automation of the envisaged system from a concept to an effective practical reality would necessitate careful project and contractual management particularly at the design and contract specification stages.



The automated fare collection system spans all modes of the metropolitan public transport system.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC questions the references here and elsewhere in the report to the system's unique, technically complex and multi modal features. All features of the system that were specified in the Request for Tender were in operation in public transport systems in Australia and/or overseas. The Request for Tender emphasised the requirement for proven equipment, components and computer systems.

INITIAL PLANNING AND THE DECISION TO FAST-TRACK IMPLEMENTATION OF AN AUTOMATED SYSTEM

4.19 In the Auditor-General’s November 1990 report on Met Ticket, concerns were expressed with the insufficient emphasis given to ensuring a comprehensive feasibility study prior to introduction of that system and with the fast-tracking of project management practices during the development of the system. The Auditor-General stated that:

“In view of the impending recommendation by the Government Task Force of a suitable ticketing concept to replace Met Ticket ... [and] Given the problems illustrated in this Report I would hope that a sufficient lead time is made available for undertaking a detailed feasibility study ... to ensure that the proposed new ticketing system is effectively and efficiently implemented.

“Many comments [within the Report] are derived from the very short implementation timeframe set for Met Ticket which meant that a fast-track method of project management had to be adopted. This feature of Met Ticket was the most critical factor leading to a number of the problems that arose.”

4.20 In addition, a steering committee established by the PTC to oversee the development and implementation of an automated system recognised the need for careful planning of the system prior to its implementation. The following extract from minutes of the committee’s July 1992 meeting illustrated this point:

"It was emphasised that implementation of an AFC [Automated Fare Collection] system should not be rushed and ... experience, where over a year of planning and system specification has been undertaken prior to implementation, was referred to."; and

"... the PTC has the advantage of being able to observe the systems operating in other Australian cities to determine the advantages and disadvantages of each, prior to finalising specifications for an appropriate system for Melbourne."

Absence of a formal feasibility study

4.21 Despite the previous experience with Met Ticket, the steering committee’s recognition of the importance of initial planning and the availability of information concerning international and interstate experiences, a formal feasibility study was not undertaken for the automated system. Instead, reliance was placed on various studies performed over the previous decade and on the technical knowledge and expertise gathered by PTC staff over that time.

4.22 In the absence of a feasibility study, a detailed financial analysis of potential costs and benefits was not performed until July 1993, which was around 3 months after commencement of the tender evaluation process. Similarly, there was no community consultation undertaken during this initial planning stage to identify the needs of particular groups of public transport users such as the elderly and disabled.

4.23 Reliance on previous studies and the in-house knowledge of staff was sufficient for some facets that would normally be considered in a detailed feasibility study. However, in audit opinion, the lack of time devoted to a formal evaluative study incorporating a robust analysis of costs and benefits and adequate community consultation increased the risk that problems would arise during the subsequent implementation of a system which was unique to Victoria.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

It was appropriate for a detailed financial analysis of potential costs and benefits to be conducted in July 1993 as prior to that, sound estimates of costs and benefits and system impacts could not be determined in detail.

There were considerable consultations with the community on operating details during the design and development phases.

Implications of a fast-track management approach

4.24 The major reason for the lack of a detailed feasibility study was a decision recommended by the PTC and approved by the Government to “fast-track” system implementation in order to address deficiencies in the earlier Met Ticket system and implement more effective ticketing arrangements as soon as possible.

4.25 A system concept statement, prepared by the PTC in December 1992, identified a number of principles and key issues that had to be considered in the development and implementation of an automated system. The statement included recognition that:

- the conduct of a detailed feasibility study would have allowed for a greater consideration of how an automated system would evolve and how this evolution could be allowed for in the initial equipment specification;
- extensive time would be required to successfully implement the system based on interstate and overseas experience where the process of specification took between 18 months and 3 years; and
- a fast-track approach would carry far greater risk that the project would not meet its objectives.

4.26 Despite these comments, the concept statement concluded that:

- the specification process could be shortened by using the experience of other Australian States, but to significantly shorten the time would require fast-track approval; and
- fast-tracking the implementation of the automated system could result in the installation of equipment in October 1993 and completion of the system by March 1994.

4.27 On the basis of the concept statement, the Government granted approval in January 1993 for the implementation of the automated system to be fast-tracked with a request for tender documentation to be prepared within 2 weeks (which was later extended to 6 weeks).



4.28 As previously mentioned, the implementation of an automated system for metropolitan public transport was an innovative and complex project requiring careful planning and appropriate implementation time frames.

4.29 Given this critical factor and the major problems previously experienced from fast-tracking the Met Ticket project, the decision to fast-track implementation of this new automated system and bypass many activities normally undertaken during the initial planning phase of such a project created for the Government far greater exposure to the risk that the objectives of the system would not be achieved within the established timelines.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The decision to “fast track” the systems’ implementation was taken in the context of the PTC’s desire to achieve greater efficiencies by the provision of an effective, efficient and reliable revenue collection and ticketing service with the ability to provide accurate, timely information relating to revenue, ticketing and operational performance. The PTC sought to use the expertise of the private sectors’ specialised knowledge of automated ticketing systems. By specifying the operational outputs required of the system, the contractor assumed the risk of designing, developing and installing a system that met those operational requirements. PTC has been protected from that risk. At no stage during the bid process did bidders express any concerns about the established timeframes for the delivery of the system.

PREPARATION OF THE REQUEST FOR TENDER

4.30 Following the decision to proceed with an automated system, the PTC sought registrations of interest from potential suppliers of the system. The PTC subsequently received 5 expressions of interest. Given this small number, and the fact that 2 were not considered capable of effectively meeting requirements, the PTC appropriately concluded that a formal shortlisting process was not warranted.

4.31 Each of the 3 expressions of interest considered worthy of further consideration were structured on a consortium approach under which a group of companies proposed a joint solution to the implementation of an automated system.

4.32 Given the complexity of the proposed automated system and the lack of emphasis given to initial planning, the ultimate success of the project became dependent on the preparation of a detailed request for tender document and the identification and subsequent appointment of an appropriate supplier.

4.33 The request for tender document was completed on 1 March 1993, approximately 6 to 8 weeks after initiation of the project, and was forwarded to each of the 3 potential suppliers. The document incorporated the aim to “*obtain a proven, reliable Automated Fare Collection system (AFC) that will allow the integration of the full spectrum of city and urban transit networks, operating a range of trams, trains and buses owned and operated by both Government and private operators under a single ticketing, revenue collection and management system*”.



4.34 The request for tender included the following requirements:

- potential contractors to provide solutions that achieve the Government’s broad business outcomes outlined in the document;
- potential bidders to address 2 distinct scenarios comprising responsibility to:
 - design, supply, maintain, own and operate an automated system in which the PTC would not retain any direct interest (i.e. outsourcing under a “*build-own-operate*” arrangement); and alternatively
 - develop and supply a system to be acquired and subsequently operated directly by the PTC;
- proposals to be submitted within approximately 7 weeks;
- development of detailed technical and functional specifications by the successful contractor following awarding of a contract;
- implementation of the system in 2 phases with the initial phase requiring successful operation of all system components as an integrated system; and
- target completion dates for system implementation to be “*as soon as practicable*” but the initial implementation phase to be completed no later than 41 weeks from the date of acceptance of a tender and final implementation no later than 104 weeks after this acceptance date.

4.35 After examination of the process relating to the preparation and content of the request for tender, audit formed the view that:

- the 6 to 8 weeks allowed for preparation of the request for tender was an extremely short time frame given the nature, scope and complexity of the project and international and interstate experience with similar projects;
- the decision for detailed system specifications to be prepared by the successful contractor following the awarding of the contract placed significant reliance on the contractor to develop a system suitable to Melbourne’s unique public transport system; and
- the proposed implementation timelines stated in the request for tender (that is, 104 weeks for full system implementation and 41 weeks for implementation of the first phase) were not based on any form of technical analysis and were clearly unrealistic for a project of this nature.

4.36 Given the shortcomings in initial planning and the decision to rely on the contractor to prepare detailed system specifications to meet broad PTC requirements, implementation of an effective evaluation and selection process would have been absolutely critical for a successful outcome. Such an approach was followed to ensure that, as far as possible, the selected contractor could deliver a technically viable solution in the minimal timeframe allocated by the Government.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

It is PTC’s view that the decision to outsource the provision of the AT system was deliberately intended to place significant reliance on the contractor and hence gain the benefit of that contractors’ expertise while protecting the PTC from unnecessary risk.

To the best of PTC’s knowledge, at no stage did any of the tenderers or the contractor object to the proposed implementation time lines stated in the request for tender.

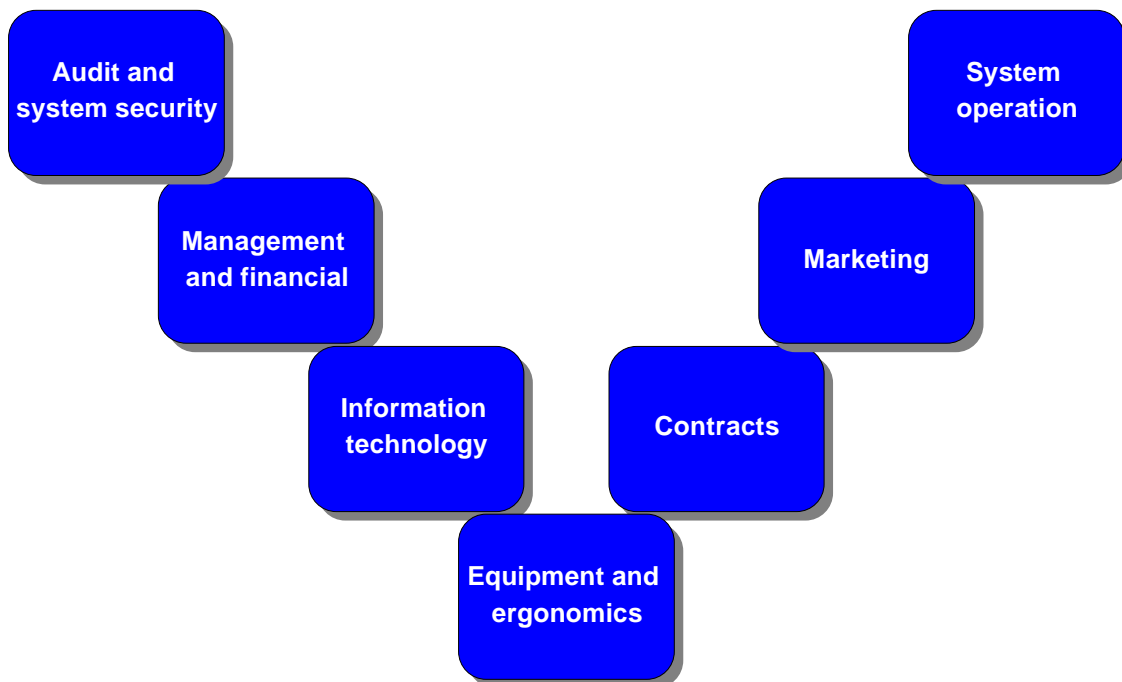
EVALUATION OF SUBMISSIONS FOR THE AUTOMATED SYSTEM

Framework for evaluation of submissions from potential contractors

4.37 The PTC established the following structures and processes to evaluate the bids received from the 3 potential contractors:

- identification of 7 elements, as outlined in Chart 4A, considered to be of key importance to effective evaluation of the 3 bids received;

**CHART 4A
7 KEY ELEMENTS FOR EFFECTIVE
EVALUATION OF SUBMITTED BIDS**



- the establishment of 7 evaluation teams, each with responsibility for evaluating bids in line with one particular key element;
- the engagement of external consultants to review the evaluation methodology and participate in the selection of team membership;



- membership of teams to be based on expertise relevant to each team’s terms of reference and to comprise representation from the PTC, the former Ministry of Transport and, where considered necessary, private sector experts;
- the establishment by each team of relevant evaluation criteria weighted by level of priority;
- a requirement for all financing elements of the bids to be analysed by the Department of Treasury and Finance;
- a separate report from each team ranking the 3 bids; and
- an Evaluation Committee, comprising the chairpersons of each of the 7 evaluation teams, to collate the findings of the teams and make recommendations on the appointment of a preferred supplier.

4.38 Audit considered that the structure and process established by the PTC represented a sound framework for ensuring an effective and fair selection process.

Initial evaluation of proposals

4.39 Following initial evaluation of the proposals received, the PTC decided that the 3 bidders had the capability to assume responsibility for all aspects of the automated system under a “*build-own-operate*” outsourcing arrangement. The option for supply of a system to be owned and operated by the PTC was not considered further as the PTC considered the outsourcing arrangement provided a satisfactory outcome.

4.40 The evaluation committee’s initial report included a score for each of the 3 bids based solely on an assessment of the ability of each bid to meet PTC requirements without consideration of other factors such as comparative capital, management and operating costs. Major conclusions outlined in this initial report were that:

- the 3 potential contractor bids were compliant with PTC specifications and accordingly received high and similar scores ranging from 76 per cent to 82 per cent;
- all 3 bidders demonstrated the ability to successfully install, operate, manage and maintain the automated system;
- all equipment referred to in bids was either proven operationally or, in the case of prototype technology, had proven componentry;
- the functional requirements of the PTC could be met by all 3 bidders; and
- the incorporation of proximity cards (i.e. touch cards) was seen to be a very good initiative offering significant benefits in meeting the needs of disabled groups, and an excellent ticketing medium for yearly and student passes.

4.41 Audit was unable to fully review all detailed evaluation steps undertaken during the selection process as the PTC could not locate for audit examination the final reports of 2 of the 7 evaluation teams. In the absence of this complete information, audit was unable to fully substantiate the final weighted scores allocated to the 3 bids or to analyse any other issues raised by evaluation teams.



4.42 In June 1994, the PTC appointed a consultant to review the methodologies and processes employed during the evaluation process in relation to financial and management issues, marketing, operations, information technology and equipment and ergonomics. The consultant found that the processes and actions undertaken by the PTC were “*appropriate and sufficient*”. In the absence of all final reports prepared by the PTC’s evaluation teams, as referred to in the preceding paragraph, audit can gain some comfort from the conclusion drawn by the consultant on the evaluation process.

Reference and site checks

4.43 The closeness of the weighted scores at the completion of the initial evaluation phase ensured that implementation of a program of reference checks and site visits would become important determinants of the final selection of a preferred contractor.

4.44 Reference checks were vital to the outcome, not only to gain a degree of confidence in the potential contractors, but to identify the extent of any problems experienced by potential contractors in other similar projects. The PTC conducted the reference checking process by way of questionnaires to either a number of existing sites operated by each of the 3 bidders or to individual companies comprising the consortia bidding for the project. Audit was satisfied that the processes and level of reference checking undertaken by the PTC were adequate.

4.45 The need to conduct site visits was recognised as an important element of the selection and development process and, as a consequence, the project steering committee gave in-principle agreement for site visits in July 1993. Further, in a recommendation made by the then Chief Executive Officer of the PTC to the Secretary of the then Ministry of Transport and the Minister for Transport in November 1993, it was stated that:

“In order to obtain maximum benefit for the experience of operators and to ensure that all aspects of the management and operation of an AFC system are fully developed prior to the final specification of the Melbourne system, it is essential that PTC staff visit a number of selected sites to have detailed discussions with operators. In order to maximise the effectiveness of these discussions and enable incorporation of these findings in the AFC contract, it will be necessary for team members to depart no later than mid-November 1993”.

4.46 Despite the importance of undertaking site visits prior to selecting the preferred tenderer, a 17 day overseas visit to inspect sites was not undertaken by PTC officers until 30 May 1994 which was a week after the signing of the contract with OneLink. Accordingly, information gained from this overseas visit was considered by audit to be of no value to the evaluation process.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The recommendation made by the Chief Executive Officer of the PTC to the Secretary of the then Ministry of Transport and Minister of Transport in November 1993 was referring to the evaluation of all aspects of management and operation of the system.

As such this overseas visit was not an element of the selection and development process. It provided very valuable information in relation to all aspects of management of operation of an automatic ticketing system.

Selection of OneLink as the preferred contractor

4.47 At the end of the initial evaluation process the project steering committee, in its July 1993 report, approved the project for further development. It recommended that the PTC undertake further negotiation and submission of revised tenders from each of the 3 bidders covering areas such as:

- the contractor assuming 100 per cent ownership of the automated system;
- introducing an element of incentive to the fee structure;
- changing the specification to include smart card and credit card facilities; and
- obtaining best price and commercial advantage for the PTC.

4.48 Revised bids were received from the 3 potential contractors in August 1993. As all bids complied with PTC’s revised requirements, the ultimate selection of the preferred contractor was to be based on price.

4.49 The variations to the initial bids supplied by each of the potential contractors resulted in a significant increase in price for 2 of the bids and an even more significant reduction in OneLink’s bid. For the proposed period of the contract, the bid of OneLink decreased by \$89.1 million or 20 per cent to \$344.2 million (final bid subsequently negotiated with the PTC to around \$332 million). As a result, OneLink’s final bid was amended from the highest of the 3 potential contractors to approximately \$80 million below that of the next cheapest bid.

4.50 The project steering committee concluded that the substantial decrease in the tendered price of OneLink was based on the revision of a number of assumptions included in its initial bid, namely:

- a literal interpretation of the request for tender in its initial bid which OneLink believed had resulted in an over-specification of its proposed system;
- a provision in the initial bid for substantial system growth over the 10 year contract period and related higher levels of expenditure; and
- an initial proposal to manage a marketing strategy designed to promote public transport in general rather than just the fare collection system in particular.

4.51 Despite the major reduction in price, OneLink provided assurances that the original scope in relation to the management, operation, maintenance and promotion of the system remained intact.



4.52 The ability of OneLink to reduce its bid by around 20 per cent was the deciding factor in the PTC nominating to the Government that OneLink be appointed as the preferred contractor. Following Cabinet endorsement, OneLink was advised on 13 September 1993 of its appointment as the preferred contractor.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

There should be no implication that OneLink was given an opportunity to amend its bid in isolation. The process was signed off by the probity auditors.

Evaluation of OneLink's capacity to deliver PTC information and reporting requirements

4.53 A key feature of the evaluation criteria used for selection of a contractor was the ability to deliver an automated system which met the extensive information and reporting requirements of the PTC. This pre-requisite involved:

- continuous monitoring and control of the operations of ticket vending machines;
- up-load and down-load facilities for fare information;
- the distribution of ticketing, operational and sales data to rail stations and tram and bus depots;
- the ability of the system to receive, analyse, summarise and prepare reports on equipment, sales and operations and forward this information to the PTC via a direct communication link;
- a communication interface between the fare collection equipment and the PTC's Automatic Vehicle Monitoring System to provide real time communications and data links to trams;
- standard sales, revenue and patronage reports;
- an ad hoc reporting facility;
- consolidated reports on a monthly, quarterly and annual basis;
- a full audit trail capable of generating full reconciliation of transactions;
- on-line facilities for relevant PTC staff;
- a capability of retaining 3 months' data on-line including ticket sales, validations and other system processes; and
- the ability for data covering the previous 15 months to be recalled within one day of request.

4.54 As mentioned in an earlier paragraph, the overall technical merit of all 3 bids was assessed favourably by the PTC. Nevertheless, OneLink's capacity to meet the PTC's important information and reporting needs was ranked last of the 3 bids. Having assigned this ranking, the relevant evaluation team recommended that, if OneLink was ultimately nominated as the preferred contractor, detailed functional specifications would need to be developed in conjunction with the contractor prior to the signing of the contract. Such action was seen as essential in order to mitigate the risk of OneLink being unable to fulfil the PTC's requirements.



4.55 The above recommendation was not ultimately adopted as the decision to fast-track the implementation of the automated system prevented development of functional specifications until after the signing of the contract.

4.56 In retrospect, the views of the evaluation team have been vindicated. As explained in some detail in Part 6 of this Report, OneLink has been unable to date to satisfy the requirements of the PTC as to the completeness and accuracy of the financial and management information generated by the automated system. The PTC views this situation as a major impediment to final commissioning of the system.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC believes that the development of detailed functional specifications prior to the signing the contract would have increased the risk to the PTC in the event that the functional specifications were inadequate. The PTC believes that the specifications incorporated in the Service Contract satisfied the issues raised by the evaluation team.

The PTC disagrees with Audit’s comments. The evaluation team assessed that the OneLink solution satisfied the specifications of the tender. Functional specifications for management information and reporting have been developed as part of the development process within the contract.

DECISION TO TOTALLY OUTSOURCE

4.57 As mentioned in an earlier paragraph, the request for tender document required potential bidders to respond in relation to 2 options, either to assume full responsibility for all aspects of the automated system under a “build-own-operate” outsourcing arrangement or to develop and supply a system to be owned and operated by the PTC. Following initial evaluation of proposals submitted by the 3 bidders, the PTC decided to pursue the outsourcing option.

4.58 Clearly, the decision by the PTC to pursue a build-own-operate arrangement created the potential for major benefits in the form of:

- efficiency gains likely to be available from the reductions in staff numbers made possible by removing the need for PTC involvement in system operation and the majority of other fare collection activities;
- eliminating the risks associated with the ownership of the automated system; and
- shifting the risk of potential design and operating cost overruns to OneLink.



4.59 However, the arrangement followed for the project also gave rise to a range of additional risks requiring careful management. These specific risks included:

- an almost total reliance on OneLink for:
 - preparing detailed system specifications and subsequently designing and developing a system that satisfied the broad objectives established by the PTC;
 - achieving required implementation milestones and ongoing operational performance standards; and
 - operating the system in a manner which meets the requirements of public transport users;
- the adverse impact of any delays or problems which might arise during system implementation on public satisfaction with the transport system and, as a result, on PTC fare revenue.

4.60 The decision to rely totally on the contractor to prepare detailed specifications to meet the broad outcomes required by the PTC was critical to the subsequent success or otherwise of the project. In this regard, the Infrastructure Unit of the Department of Treasury and Finance, in a minute to the Treasurer dated 9 December 1996, expressed the opinion that “*the system was poorly specified when executed [signing of contract], and rigour was only introduced into the specifications ... in the Collateral Agreement [a revised agreement for the project entered into in September 1995]*”.

4.61 The risks associated with fast-tracking and outsourcing of the arrangement for implementation and operation of the automated system were referred to in an October 1997 report by an external consultant engaged by the PTC to assess whether the project should continue, given the significant delays which had already occurred. The consultant found that:

- The implementation of this system was a world first in terms of a fully outsourced major public transport function, and of the size and complexity of the system;
- A number of processes were not performed by the PTC which should have been executed in the initial stages of the project, namely:
 - an assessment of reliability and system accuracy requirements;
 - a review of the plans for system roll-out (i.e. progressive installation);
 - identification of international benchmarks for similar systems; and
 - conduct of a comparative analysis of requirements against those benchmarks.
- The PTC’s original schedule was very aggressive given the longer lead time taken by overseas operators to implement smaller, less complex systems; and



- Typically, outsourcing arrangements do not achieve their objectives if the contractor lacks an in depth understanding of current processes and does not develop the expertise to direct and manage information technology investments. The consultant considered, in the case of the automated system, that OneLink lacked experience:
 - as a public transport operator;
 - as a fare collection operator;
 - operating a transaction processing system; and
 - maintaining a fare collection system.

4.62 The unique nature and complexity of the proposed automated system would have placed any selected contractor in the position of initially lacking experience in the development and operation of such a system. Given these factors, greater emphasis should have been placed by the PTC on the initial planning phases of the system instead of fast-tracking the project (the adverse consequences of this strategy were referred to in earlier paragraphs).

4.63 In summary, the decision to outsource all aspects of system development and implementation under one contractual arrangement provided the potential for significant benefits and enabled the Government's preferred fast-track approach to be pursued. However, given the complexity of the project and the associated risks involved, consideration should have been given to adopting a 2-phased approach to outsourcing under which:

- detailed specifications and requirements were prepared by a contractor under an initial arrangement; and
- a further arrangement for development, implementation and operation of the automated system in line with these specifications is entered into with the same or another contractor, but only after successful completion of the specification phase.

4.64 Such an approach would have allowed more exhaustive evaluation of the extent to which proposals by potential contractors would comply with detailed specifications and facilitate assessment of the appropriateness of proposed installation milestones prior to the long-term commitment to one contractor for managing all aspects of the automated system. While this observation is made by audit with the benefit of hindsight, many of the risks associated with the adopted approach had been identified by the PTC in the early stages of the project but were not addressed due to the fast-tracking strategy.

4.65 In terms of lessons to be learned from this project, the Government should consider the adoption of a 2-phased approach in any future outsourcing arrangements involving technically complex systems or processes.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

As previously stated it was the intent of the outsourcing arrangement to place the reliance and risk on OneLink for the design, implementation and operation of the system in accordance with the requirements specified by PTC and subject to the performance standards contained within the Contract.

The PTC rejects the Report's finding that OneLink's inability to deliver all of the PTC's requirements in a timely fashion is the result of functional specifications not having been developed prior to the signing of the contract. The evaluation team which selected OneLink was satisfied that OneLink met the tender specification. To have signed the contract after the development of functional specifications could have passed the risk of any non-performance to the PTC and would not of itself have guaranteed that the specifications would meet the operational requirements.

The PTC specified its availability requirements. Availability is determined by the equipment reliability and maintenance service response times. It is OneLink's responsibility to achieve the availability levels specified by ensuring sufficient equipment reliability and adequate service response times to achieve that level of availability. The PTC specified these levels of availability based on its operational requirements and the input from tenderers.

System rollout was subsequently undertaken on a revised geographic area and mode based plan.

Identification of international benchmarks for similar systems was undertaken.

At the time of Phase 1 commissioning, equipment was performing at a level in accordance with the performance standards specified.

None of the bidders had objected to the timeframes specified by the PTC.

The PTC believes that the development of detailed functional specifications prior to the signing the contract would have increased the risk to the PTC in the event that the functional specifications were inadequate. The PTC believes that the specifications incorporated in the Service Contract satisfied the issues raised by the evaluation team.

The PTC believes that the adoption of a two phased approach to outsourcing has the potential to expose the government to increased risk. Firstly, a contractor will develop specifications which reflect its particular experience and solutions. This will deny the Government the opportunity to consider alternative solutions. Secondly the Government will then assume the "specification" risk when the specification is finalised. Should this specification not deliver the desired outcomes, Government would bear the risk.

PTC believes that this option compares unfavourably with the risks associated with inadequately defining the outputs required when the PTC is well experienced in its operational requirements. It is also the PTC's understanding that Government policy, and previous Auditor General reports, strongly discourage a process whereby an external tenderer who develops a system specification is then invited to bid for that specification. Finally, the limited number of potential suppliers would have been further restricted by denying one of the contractors the ability to bid for specifications it had prepared. This would have rendered the PTC only able to choose from two potential contractors for this project.

PTC believes that a significant lesson that has been learned from the project is that outsourcing and risk transfer can be achieved with limited risk to the government.

Part 5

Contractual arrangements for the automated system



OVERVIEW

5.1 The contractual arrangements between the PTC and OneLink are essentially performance-based with payments to OneLink, totalling around \$332 million over the term of the agreement, dependent on the extent to which milestones and performance standards for the commissioning and ongoing operation of the automated fare collection system are achieved. Overall, the contract is very sound in protecting the interests of the Government. In particular, the linking of payments to the achievement of commissioning milestones and performance standards provided a major financial safeguard in the event of non-performance by OneLink.

5.2 A stated aim of the PTC was to provide incentives to ensure that the contractor performed to the expectations of the PTC. Accordingly, the contract includes a framework for bonus payments for overperformance by the PTC and compensation payments to the PTC for underperformance. While recognising the merit in this approach, audit considered that, in most circumstances, the relatively small amount of potential bonus payments provide minimal incentive for OneLink to achieve higher levels of performance.

5.3 The extensive range of performance standards and service targets incorporated in the contract were related mainly to overall levels of availability of various system equipment and components. These standards and targets, although high by world standards, were developed against the background of the high transaction environment in which the automated system was to operate and the potential impact upon revenue should equipment be unavailable for even the shortest periods of time. Overall, audit concluded that the range of standards and requirements established for all major aspects of the system provided a sound basis for the PTC to monitor whether the performance of OneLink was in line with contractual requirements.

5.4 Action taken to vary contractual rights and conditions throughout the term of the contract to date has reflected the desire of both parties to allow continuation of the project without recourse by either party to action aimed at either pursuing progressive compensation or, ultimately, terminating the contract. It should be recognised, however, that the bulk of the changes subsequently incorporated in the contract would not have been necessary if major problems had not been experienced in meeting the key milestones which were agreed by the parties in May 1994.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The statement that there is a minimal incentive for OneLink to exceed the approved performance standards must be assessed against the statement in paragraph 5.17 which confirms that the approved performance standards are "high" by world standards. The potential for significant compensation/ withholding payments in the event of non-compliance with the performance standards is a strong incentive to achieve those standards.



INITIAL CONTRACTUAL ARRANGEMENTS

Terms and conditions in the contract

5.5 The nature of the 1994 contract required OneLink to provide a “*total management concept*” for the design, development, installation and operation of fare collection on behalf of the PTC (i.e. a totally outsourced arrangement). As a consequence, a substantial contract supported by detailed schedules was necessary to cover all key aspects of the introduction and operation of the automated system. The contract detailed supporting activities such as the establishment and management of a retail agency network and public education activities associated with the new ticketing arrangements.

5.6 Chart 5A summarises the key responsibilities of OneLink by subject heading as set out within the initial contract.

**CHART 5A
SUMMARY OF ONELINK'S RESPONSIBILITIES
UNDER THE 1994 CONTRACT**



Source: 1994 contract between the PTC and OneLink.



5.7 The structure of the contractual documentation reflects the outsourced responsibility for fare collection and is essentially performance-based. Key provisions of the contract include:

- detailed performance standards and obligations for both the commissioning and ongoing operation of the automated system over the term of the contract;
- specific milestones for the commissioning of the system in 2 phases comprising:
 - *Phase 1 commissioning*, (target date: February 1995) - in effect a pilot project involving design and implementation of the system to satisfy performance obligations on around 10 per cent of the total public transport system in distinct geographical areas; and
 - *Remainder (final) commissioning* (target date: February 1996) - culmination of the staged implementation and commissioning of the system in line with performance requirements throughout the remaining 90 per cent of the public transport system and the meeting of other contractual conditions such as requirements for management information;
- a total cost to the PTC of around \$332 million with payments directly linked to the achievement by OneLink of milestones and performance standards in that:
 - OneLink was not to receive any payment until phase 1 commissioning was achieved;
 - following completion of phase 1, OneLink would receive payments based on a pre-determined schedule included in the contract and on costs incurred on marketing and other aspects of the system;
 - full payments for system operation of around \$36 million per year would not commence until final commissioning of the total system had eventuated; and
 - the total cost of the contract could be varied through various bonus and compensation payments dependent on the extent to which performance standards were achieved;
- a contract term extending approximately 8 years following final commissioning of the system; and
- retention of system ownership by OneLink with an option for the PTC to purchase equipment for a nominal amount following expiry of the contract.



5.8 Apart from the contractual arrangements referred to above, which provide for full payments to OneLink only after final commissioning, the Government has also taken steps to ensure its interests are protected in the event of OneLink failing to meet its contractual obligations. This protection has been achieved in the following manner:

- OneLink is a subsidiary of a parent company owned by the consortium of large established international companies which is financing the project. Audit established that the consortium has entered into an arrangement with OneLink under which ongoing finance is guaranteed to OneLink up until the point of final commissioning of the project; and
- The ticketing equipment is leased to OneLink by an equipment hire company which is also a subsidiary of the consortium. Notwithstanding the fact that OneLink does not own the equipment it is utilising on the automated system, under the contract the PTC has “*step in rights*” to take over ownership of the equipment in the event of OneLink failing to complete the contract. The Government would then have the right to allow the PTC to complete the project and either operate the system or find another operator.

5.9 Audit is satisfied that these arrangements provide adequate protection to the Government in the unlikely event of OneLink failing to complete its contractual obligations.

5.10 Overall, the contract signed by the parties in May 1994 was very sound in protecting the interests of the Government. In particular, the linking of payments to the achievement of commissioning milestones and performance standards provided a major financial safeguard. Audit considered that the various problems which have been experienced to date have related principally to the inability of OneLink to satisfy the PTC that it had met its contractual requirements as distinct from any weaknesses in the underlying contractual documentation.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

Total cost of the contracts could also be varied by changes to increase or decrease the quantity of equipment or software or scope of the contract.

**PERFORMANCE STANDARDS AND OBLIGATIONS INCORPORATED
IN THE CONTRACT**

An outline of the performance standards and obligations

5.11 Because the contract is essentially performance-based, it incorporates an extensive range of performance requirements comprising:

- performance standards, mainly in terms of system availability and relating to 3 specified levels of performance by OneLink, namely:
 - *Approved Performance Standards*, which indicate the desired level of ongoing system performance stipulated for OneLink in order to receive full contractual payments;
 - *Essential Service Obligations*, dealing with the minimum level of performance for major components of the automated system which must be achieved prior to acceptance by the PTC of both phase 1 and final commissioning and were considered critical to the efficient operation of the system; and
 - *Deemed Non-Service Delivery*, which indicates the level of performance at which individual system components are considered to be out-of-service resulting in OneLink forfeiting its entitlement to payment;
- additional service standards covering such areas as response times for system components, management information requests and customer service and information.

5.12 The various categories of performance standards have a direct relationship with:

- acceptance by the PTC that the automated system can be commissioned and thereafter continues to perform in line with required standards; and
- the level and timing of payments made to OneLink (as previously mentioned, payments could not be received until the phase 1 commissioning occurred).

5.13 The contract specified that “*PTC’s primary aim is to foster an on-going relationship with the contractor which maximises performance and therefore returns to both parties*”. It was in line with this aim that a framework for bonus and compensation payments between the parties was established.

5.14 The relatively small amount of potential bonus payments within the contract provides minimal incentive for OneLink to perform above approved performance standards. As an example, bonuses are payable up to a maximum of \$400 000 for exceeding performance standards, a level which represents only one per cent of total contractual payments of \$36 million per year.



□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC disagrees. There are large compensation payments for a failure to meet approved performance standards. These amounts are in addition to the withholding and forfeiture payments regime which is applicable to failure to achieve the Essential Service Obligations. Accordingly, the PTC does not agree that there is minimal incentive for OneLink to perform above the Essential Service Obligations or to meet Approved Performance Standards.

Levels of performance required of OneLink

5.15 The external consultant engaged by the PTC in October 1997 to undertake an assessment of whether the project should proceed (previously mentioned in Part 4 of this Report) also furnished the following comments on the performance requirements for the automated system:

- Performance requirements are high in light of the difficulties international suppliers have had in meeting lower levels of performance;
- Even though the performance standards entail substantially more detail than other worldwide systems, they fail to address the critical matter of equipment reliability (i.e. how well the equipment operates as distinct from the length of time for which the equipment is available), which was a requirement of the tender;
- Rather than a system-wide approach to measuring performance in terms of availability (the approach set out in the contract), availability should be measured on a per-station or per-vehicle basis. In addition, the contract should address the measurement of reliability in terms of particular types of equipment operating in both high and low transaction volume environments; and
- The requirement for 100 per cent completeness and accuracy of all financial data of the system is impossible to achieve.

5.16 The PTC advised audit that the performance standards and targets were developed against the background of the high transaction environment in which the automated system was to operate and the potential impact upon revenue should equipment be unavailable for even the shortest periods of time. It also indicated that performance standards were in some cases nominated by OneLink during the tender stage based upon its experience in developing ticketing systems.

5.17 With the exception of the matters identified by the consultant, audit considered that the extensive range of standards and requirements established for all major aspects of the automated system provided a sound basis for the PTC to monitor whether the progressive performance of OneLink was in line with contractual requirements.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The performance standards relate in general to the equipment availability which is entirely appropriate given the outsourced nature of the contract. The achievement of the availability performance standards required in the contract is dependent on OneLink achieving satisfactory equipment reliability standards and timely fault rectification. Hence the use of availability is an entirely appropriate measure as it requires OneLink to achieve a satisfactory combination of equipment reliability and service responsiveness.

An independent expert, jointly appointed by PTC and OneLink Transit, found that 100 per cent completeness and accuracy of all financial data is the requirement to be achieved by OneLink.

CHANGES TO INITIAL CONTRACTUAL ARRANGEMENTS
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5.18 A number of agreements have been entered into between the PTC and OneLink since the signing of the contract in May 1994. Generally, these agreements have included revised target commissioning dates as a consequence of the recurring delays experienced in implementing the automated system to an agreed standard of performance. Detailed reference to the nature and extent of these delays is provided in Part 6 of this Report.

5.19 The execution of these agreements has also enabled conditions seen as having “commercial benefit” for both parties to be introduced with the aims of minimising disputes and allowing a concentration on progressing project implementation. As an example, in one agreement the PTC waived all claims for project delays prior to 21 April 1997 and OneLink waived the right to pursue compensation for extension of time allegedly arising from PTC or government delays.

5.20 Table 5B summarises the major contractual amendments agreed between the parties since the signing of the contract.

TABLE 5B
SUMMARY OF MAJOR AMENDMENTS TO THE 1994 CONTRACT

<i>Title and date of agreement</i>	<i>Major amendments incorporated in the agreement</i>
Collateral Agreement, September 1995	<ol style="list-style-type: none"> 1. Target dates amended from February 1995 to November 1996 for phase 1 commissioning and February 1996 to November 1997 for final commissioning. 2. Suspension of rights of both parties to claims for non-compliance in order to defer disputes and facilitate system commissioning. 3. Establishment of a mechanism for nomination of an expert to resolve all disputes. 4. Clarification and finalisation of testing requirements for phase 1 commissioning. 5. Clarification of OneLink's entitlement to claim variations for "scope creep".
Collateral Agreement Supplemental Agreement, March 1997	<ol style="list-style-type: none"> 1. Further deferral of phase 1 commissioning to 21 April 1997 and of final commissioning to 30 June 1998. 2. OneLink waived right to any previous extension of time claims. 3. The PTC released OneLink from claims for delays prior to 21 April 1997. 4. OneLink retained the right to claim for variations to specifications lodged between May 1994 and March 1997, however, this right was suspended until after phase 1 commissioning was achieved. 5. Late commissioning penalties, increased to \$100 000 (from \$50 000) per week, were retained by the PTC until certain criteria in relation to final commissioning were achieved. 6. Withdrawal of both parties from any existing disputes. 7. Introduction of a \$30-\$35 million limit upon the extent to which OneLink could claim variations for "scope creep". 8. Requirement for OneLink to lodge details of its 4 most significant variation claims and to provide lesser detail in respect to its remaining claims in order to establish "scope creep".
Heads of Agreement November 1997	<ol style="list-style-type: none"> 1. Agreement for a consolidated contract to simplify the service delivery relationship and consolidate terms of previous agreements. 2. Phase 1 commissioning granted on the basis that OneLink will not be released from compliance with obligations to be performed under the May 1994 contract. 3. OneLink agreed to address PTC concerns re cash to sales reconciliation and management and financial reporting by final commissioning date of 30 June 1998. (At the date of this Report, issues related to reconciliations and management reporting are still to be resolved.) 4. All essential service obligations to be achieved on final commissioning. 5. Payments to OneLink to occur on a monthly rather than quarterly basis until final commissioning to assist cash flow. 6. All existing performance and functionality requirements to be retained with some clarification of ambiguities and imprecision in original documents.
Consolidated Service Contract, January 1998	<ol style="list-style-type: none"> 1. Consolidated service contract and subsequent agreements aggregated into a single contract.



5.21 The action taken to vary rights throughout the term of the contract to date has reflected the desire of both parties to allow continuation of the project without recourse by either party to action aimed at either pursuing progressive compensation or, ultimately, terminating the contract. It should be recognised nevertheless that the bulk of the changes subsequently incorporated in the contract would not have been necessary if major problems had not been experienced in meeting the key milestones which were agreed by the parties in May 1994.

5.22 Specific contractual amendments may, however, have an impact on the future rights of both parties and, in particular, may lead to variations in the level of payments to OneLink. Of particular relevance was the inclusion in the contract of a cap for “*scope creep*” claims made by OneLink. The PTC advised audit that the incorporation of the cap provided a ceiling above which OneLink could not claim in relation to the specified scope creep claims and this was an improvement in the position for the PTC. Nevertheless, incorporation of this cap has the potential for payments to OneLink under the contract to increase by up to \$35 million, should variations in the scope of the project be successfully claimed by OneLink. Further comment on the potentially significant ramification of this contractual amendment is included in Part 6 of this Report.

Part 6

**Extent of progress
in commissioning
the automated
system**

OVERVIEW

6.1 The history of the automated fare collection project has been predominantly one of a failure to meet a succession of revised commissioning targets. The commissioning of phase 1 of the project on 12 November 1997, essentially involving implementation of the automated system across 10 per cent of the public transport network, represented a delay of almost 33 months from the initially agreed target of February 1995. Final commissioning of the system across the remainder of the transport network had still not eventuated at the date of preparation of this Report and was around 32 months behind the original contractual requirement of February 1996.

6.2 Initial target dates for the project were very aggressive in view of factors such as the size and complexity of the automated system, the leading edge nature of the project and international experience with projects of a similar nature. However, the PTC had no option but to proceed as quickly as possible given the Government's decision to fast-track the project. Delays, at least in the initial stages, resulted from the establishment of milestones agreed by the parties under the 1994 contract that, in hindsight, were unrealistic.

6.3 The later extensive delays in achieving phase 1 commissioning resulted from continuing problems experienced by OneLink in satisfying the PTC on system operational requirements. This situation led to recurring differences between the PTC and OneLink on whether problems with the system had been satisfactorily resolved. In such circumstances, the PTC found it necessary to issue several formal preliminary notices to OneLink detailing non-compliance with the contract and requiring remedial action.

6.4 Given the level of disputation surrounding phase 1 commissioning, the 2 parties sought independent expert determinations on 3 separate occasions in October 1996, November 1996 and May 1997. The issues upon which the parties consistently sought determination were whether phase 1 commissioning had been achieved by the revised milestone commissioning dates and, if not, whether OneLink was entitled to an extension of time. On each occasion, the independent expert found in favour of the PTC in that OneLink had not fulfilled its contractual obligations to enable phase 1 commissioning to occur.

6.5 A number of issues are still to be resolved before acceptance by the PTC that final commissioning of the automated system has been achieved by OneLink. In particular, action is required to resolve matters concerning the need to achieve consistently accurate cash to sales reconciliations, management information and reporting and rectification of a range of operational problems with system equipment and components. Given these matters, the PTC advised audit that it was not currently able to determine when it would be in a position to accept that final commissioning of the system had occurred.



OVERVIEW - continued

6.6 By the end of July 1998, OneLink had received around \$17 million in payments under the contract. If both phases of commissioning had been achieved in line with the target dates agreed in the 1994 contract, it would have been eligible to receive \$107 million. In effect, OneLink has been required to finance the major part of its operations for a period of 2 and a half years in excess of what was originally intended under the contract.

6.7 A major contractual amendment agreed to by the 2 parties allows OneLink to claim additional payments for variations in the scope or specifications of the project up to a “cap” of \$30 million (or \$35 million if the PTC elects to enter an extended dispute resolution period). By the introduction of a “cap”, the PTC has sought to limit its exposure to variation claims while retaining the right to contest any claims lodged by OneLink. However, based on specialist advice, audit considered that the established cap of up to \$35 million, representing up to 42 per cent of the total capital equipment value for the system of \$83 million, was excessive. It is possible that the ultimate cost of the contract to the PTC could increase substantially if significant variation claims are lodged by OneLink and are ultimately deemed to be justified.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The ability of OneLink to claim a variation was provided for in the original service contract. The Collateral Agreement and the Collateral Agreement Supplemental agreement merely established a process for determining those variation claims. They did not grant OneLink any additional contractual rights which were not already available to it under the original service contract.

In relation to the prospect of “further significant variation claims”, any subsequent variations which arise can only be because of system changes which PTC may agree, having weighed up the cost and the benefits of any such changes.

PTC queries on what basis a cap which is required to be commercially negotiated can be “excessive” in circumstances where potential liability was previously not limited.

DELAYS IN ACHIEVING CONTRACTUAL MILESTONES

6.8 As explained in Part 5 of this Report, the 1994 contractual arrangements between the PTC and OneLink provided for commissioning of the automated system to be undertaken in 2 phases comprising a *Phase 1 commissioning* (target date; February 1995) and the *Remainder [final] Commissioning* (target date; February 1996).

6.9 Commissioning of the automated system for these 2 phases is conditional upon:

- the reaching of agreement between the PTC and OneLink that the essential service obligations embodied in the contract (as described in Part 5 of this Report) had been achieved; and
- a program of testing by OneLink of every component contained in the system and acceptance by the PTC of the results of these tests.

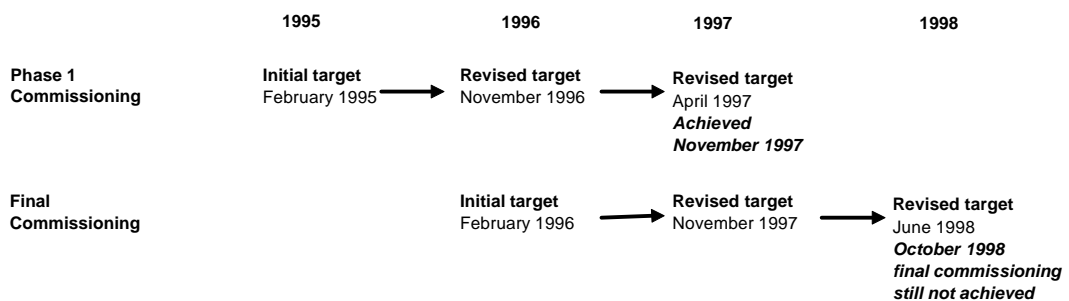
Extent of delays experienced in meeting commissioning milestones

6.10 The target dates specified in the 1994 contract for both phase 1 and final commissioning of the automated system were not achieved. In fact, the history of the project has been predominantly one of a failure to meet a succession of revised commissioning targets.

6.11 By October 1994, as early as 5 months after the signing of the contract, the PTC expressed concern at the ability of OneLink to meet the agreed targets for commissioning. At that stage, as reflected in documentation between the parties, it was estimated that the project was already at least 3 months behind schedule and the agreed target date for phase 1 commissioning, February 1995, would not be achieved.

6.12 Table 6A illustrates the extent of delays subsequently experienced for the 2 commissioning phases including the various revised milestones which were agreed between the PTC and OneLink.

**TABLE 6A
DELAYS IN ACHIEVING BOTH PHASE ONE AND FINAL COMMISSIONING**



6.13 The commissioning of phase 1 on 12 November 1997 represented a delay from the initially agreed target date of almost 33 months. At the date of preparation of this Report, the final commissioning of the automated system was around 32 months behind the original contractual requirement of February 1996.

REASONS FOR DELAYS IN COMMISSIONING

6.14 The external consultant engaged by the PTC in October 1997 to undertake an assessment of whether the project should proceed (consultancy previously mentioned in Parts 4 and 5 of this Report), considered the PTC’s original project schedule to be “*very aggressive*” in view of such factors as the size and complexity of the automated system, the “leading edge” nature of the project and the international experience of overseas operators. The PTC had previously acknowledged these factors but had no option but to proceed as quickly as possible with the project given the Government’s decision to fast-track the project (as referred to previously in Part 4 of this Report).

Some specific factors contributing to the delay in phase 1 commissioning

6.15 As mentioned in Part 5 of this Report, phase 1 commissioning constituted a pilot project involving design and implementation of the automated system in distinct geographical areas representing around 10 per cent of the total public transport system.

6.16 The principal contractual obligations which had to be met by OneLink before phase 1 commissioning could occur were:

- satisfactory completion of acceptance testing at various stages of design, development and implementation to ensure that appropriate standards of system reliability and performance were achieved;
- successful outcomes from commissioning tests (applied by the PTC to the system when it is installed and actually operating) to establish that the system conformed with specifications;
- operation of vending and validating equipment, ticket media, EFTPOS, depot computer systems and reporting systems for a 7 day period at or above essential service obligation levels;
- achievement of a reconciliation between MetCard ticket sales and cash received for 2 consecutive weekly reporting periods; and
- provision of accurate and timely reporting and financial management information for 2 consecutive weekly reporting periods.

6.17 Eventually, most of the above requirements were met by OneLink but the resultant delays meant that phase 1 commissioning did not occur until November 1997. Even at that stage, commissioning occurred without certain of the above requirements (for example, the reconciliation of ticket sales to cash received) being achieved. Accordingly, OneLink remained subject to penalties for not having delivered all elements at phase 1 commissioning.

6.18 Detailed comment on the delays experienced by OneLink in meeting the above contractual obligations is provided below.

Acceptance testing for phase 1 commissioning

6.19 An integral part of the design and implementation of any system is the ability to test the system at various stages of development to ensure that the appropriate standards of system reliability and performance are being achieved.

6.20 With the automated fare collection system, OneLink was required, under the contractual arrangements, to undertake comprehensive acceptance testing of all components of the system to the satisfaction of the PTC.

6.21 The extent of testing to be undertaken to determine whether the automated system was fully operational was evidenced within the contract by an “*AFC Test Evaluation and Acceptance Plan*” which provided for the performance of around 114 individual tests of system hardware and software. Milestones for completion of the various acceptance tests were not specifically referred to in the initial contract. However, following non-achievement of the February 1995 target commissioning date, the 2 parties reached agreement on milestone dates for the main categories of acceptance testing as a means of providing the necessary discipline for this element of the project.

6.22 Notwithstanding the initial absence of milestones, audit considered that the test evaluation and acceptance plan represented a sufficiently comprehensive document in terms of articulating the PTC’s business requirements and OneLink’s contractual obligations. However, the plan in itself could not guarantee that OneLink would achieve phase 1 commissioning in accordance with the contract.

6.23 Table 6B summarises the 3 categories of acceptance testing established for phase 1 commissioning and compares actual completion dates with milestones. The acceptance tests were invariably performed by OneLink with the PTC determining whether the results were satisfactory.

**TABLE 6B
ACCEPTANCE TESTING FOR PHASE 1 COMMISSIONING**

<i>Test</i>	<i>Nature of test</i>	<i>Milestone for completion</i>	<i>Actual completion date</i>
Formal Qualification Tests	Extensive testing to verify that equipment, hardware, software and system unit components met specified requirements.	May 1996	June 1996
First Article Acceptance Tests	Testing of the tram, train and bus sub-systems in an operational environment to provide assurance that the automated fare collection system was suitable for operation.	July 1996	February 1997
Roll-Out Acceptance Tests	Sample testing of equipment for all modes of transport to ensure that each sub-system was operating in accordance with specifications.	September 1996	March 1997



6.24 As shown in Table 6B, all 3 acceptance testing milestones were established subsequent to the failure to achieve phase 1 commissioning by the initial target of February 1995. The main delays in meeting these milestones were experienced for the first article acceptance tests and roll-out acceptance tests.

First article acceptance tests

6.25 The PTC considered the results of first article acceptance tests undertaken by OneLink were not entirely satisfactory due to equipment faults identified during testing and non-compliance with acceptance certificate procedures, for example certain OneLink documentation outlining details of testing performed and subsequent results was not made available to the PTC for its review. Despite this situation, qualified approval in July 1996 was granted by the PTC for such tests on the basis of showing “... *a gesture of goodwill at this critical stage of the project*”. The PTC requested that, for the rail and tram sub-systems, OneLink re-conduct all tests and not just those that failed and that additional tests be carried out for the bus system.

6.26 OneLink did not comply with the PTC’s request to re-conduct all tests but opted to undertake selective re-testing only. The PTC advised audit that, after subsequently determining that a requirement for full re-testing was not legally enforceable under contractual arrangements, it had no option but to accept the actions of OneLink in this regard. There was also a desire not to further delay progress of the project.

6.27 In February 1997, following the provision of information by OneLink on the results of its selective re-testing, the PTC removed all qualifications and issued acceptance certificates. In agreeing to issue acceptance certificates, the PTC advised OneLink of its disappointment that full re-testing did not occur and that it “... *is making a substantial concession by agreeing to remove these qualifications*”. In audit opinion, the significant concession granted by the PTC to OneLink, which weakened the stringency of the first article acceptance testing program, carried a risk that the equipment subject to testing may subsequently prove to be unsatisfactory.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC's legal advice was that this was in fact not a concession.

Roll-out acceptance testing

6.28 With regard to roll-out acceptance testing by OneLink, the PTC considered the initial test results were unsatisfactory given concerns raised in relation to an analysis of the results of around 167 specific tests related to faults in system equipment. Notwithstanding this situation, the PTC subsequently agreed that it was not necessary for OneLink to re-test all “failed sites” and proposed a sampling approach to finalisation of roll-out testing. In doing so, the PTC indicated to OneLink that this approach was proposed to avoid any further delays in acceptance testing for phase 1 commissioning. The PTC reserved the right to re-test all sites should the sampling test program not generate satisfactory test results. Subsequently, in March 1997, 6 months after the agreed milestone, the PTC determined to issue acceptance certificates on the basis that the retesting had produced satisfactory results.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

In Pilot Stage roll-out acceptance testing, there were test failures. These test results were not accepted by the PTC. PTC assessed that, based on the nature of the tests and the form of the tests and the fact that the sites were in use (selling and validating tickets), it was not necessary that ALL failed test sites be retested. A sampling test regime was put in place for the re-conduct of roll-out acceptance tests. The PTC reserved the right to retest ALL sites if the sampling test program did not generate satisfactory results. This is a legitimate process for the conduct of tests in this type of project, and PTC rejects audit's assertion that it represents a relaxation of contractual requirements.

Overall comment on acceptance testing

6.29 Specialist advice provided to audit indicated that overall the acceptance testing program adopted for the automated fare collection system was rigorous. However, the level of first article acceptance re-testing of a sample selection only of areas which initially produced unsatisfactory results would constitute the absolute minimum level required to be in a position to reasonably conclude that the system was operationally sound. It was evident to audit that the PTC compromised upon its initial insistence of thorough re-testing of equipment in the interest of advancing the commissioning of the system. The extent, if any, to which this decision adversely impacted upon the future operational efficiency of the fare collection system could not be determined by audit as the PTC still has reservations regarding the accuracy of the operational performance of the system.

Extent of delays arising from disagreements between the parties

6.30 Communications between the PTC and OneLink during negotiations on phase 1 commissioning were characterised by several disagreements. These disagreements essentially arose from:

- the PTC asserting that OneLink had not met requirements necessary for this initial commissioning phase and was therefore fully responsible for delays; and
- an opposite view expressed by OneLink that tests of equipment and components required by the PTC were overly-stringent and that delays were at least partially due to changes by the PTC to the initial automated system specifications.

6.31 Since the signing of the May 1994 contract, the PTC continually raised with OneLink a wide range of specific issues and concerns which it considered were delaying implementation of the system and preventing acceptance of phase 1 commissioning. Given that phase 1 commissioning had not been achieved at the initial targeted date or by 2 successive amended targets, the PTC issued a number of formal preliminary notices to OneLink detailing non-compliance with the contract and requiring remedial action (failure to satisfactorily action a notice within the specified period can constitute grounds for termination of the contract).

6.32 Table 6C summarises the various matters raised by the PTC with OneLink and the resultant formal notices issued by the PTC.

TABLE 6C
ISSUES RAISED AND NOTICES ISSUED BY THE PTC PRIOR TO
PHASE 1 COMMISSIONING

<i>Issues raised by PTC with OneLink</i>	<i>Notices issued by the PTC to OneLink</i>
<p style="text-align: center;">Factors precluding achievement of target commissioning date - February 1995</p> <ul style="list-style-type: none"> <li data-bbox="300 450 973 728">• In October 1994, the PTC considered that: <ul style="list-style-type: none"> • the target commissioning date would not be achieved; • development of functional specifications was at least 3 months behind; • delays in developing specifications were affecting progress of the project in other areas; and • OneLink was in effect "... <i>working to complete functionality [commissioning] of Phase 1 by 29 May 1995</i>". <li data-bbox="300 750 909 840">• Only 1 of 12 equipment prototypes was presented for approval of the PTC by the due dates from July to December 1994. 	
<p style="text-align: center;">Factors precluding achievement of initial revised commissioning milestone - November 1996</p> <ul style="list-style-type: none"> <li data-bbox="300 898 973 952">• Delays in completing acceptance testing in respect to all 3 transport modes. <li data-bbox="300 963 925 996">• Engineering testing of prototype equipment incomplete. <li data-bbox="300 1008 989 1086">• Non-provision of temporary portable ticket readers for use by revenue protection officers to assist checking of passengers' tickets. <li data-bbox="300 1097 957 1187">• Equipment performance in field trials demonstrated that system operation was not sustainable for a long period of time or on a larger scale. <li data-bbox="300 1198 893 1232">• Touchcards not performing to system specifications. <li data-bbox="300 1243 829 1276">• Performance reporting system not developed. <li data-bbox="300 1288 941 1321">• Access for PTC to ad-hoc reporting facility not provided. <li data-bbox="300 1332 989 1411">• Various general ledger and other reports could not be reconciled including cash collection and sales reports, ticket distribution system and retail agents records. <li data-bbox="300 1422 813 1456">• EFTPOS facility not provided at rail stations. 	
<p style="text-align: center;">Factors precluding achievement of further revised commissioning milestone - April 1997</p> <ul style="list-style-type: none"> <li data-bbox="300 1503 798 1536">• Failures of ticket and validating equipment. <li data-bbox="300 1547 941 1601">• Reports provided by OneLink did not include Touchcard validation details. <li data-bbox="300 1612 845 1646">• Cash to ticket sales reconciliation not achieved. <li data-bbox="300 1657 989 1713">• Recall by supplier of portable ticket reader technology due to software problems. <li data-bbox="300 1724 973 1780">• Financial reports were unreliable as to accuracy, timeliness and integrity of data. <li data-bbox="300 1792 702 1825">• EFTPOS facility still not provided. <li data-bbox="300 1836 989 2027">• While around 84 per cent of commissioning tests of equipment and components had been finalised and the PTC had verified that essential service obligations had been achieved, the PTC considered that "... <i>the test failures outstanding at this time are material and critical with respect to the required functionality. In particular, ticket vending and fare avoidance functions remain incomplete</i>". 	

Source: Various documentation held by the PTC.

6.33 Many of the issues raised by the PTC, as identified in Table 6C, regarding the failure to achieve progressive commissioning milestones were disputed by OneLink. In fact, apart from non-compliance with the initial targeted date of February 1995 for phase 1 commissioning and February 1996 for final commissioning, OneLink asserted that it had fulfilled its contractual obligations and that system commissioning should have occurred as early as November 1996 for phase 1 and November 1997 for final commissioning (the first revised milestone dates). Other points made by OneLink were:

- In regard to the alleged tardiness in the development of equipment prototypes, OneLink lodged a notice of delay on 12 January 1995 for an additional 220 days for time spent in satisfying PTC requirements. OneLink argued that prototypes were submitted and “generally approved” by the PTC in July 1994. However, despite this general approval, OneLink contended that the approvals by the PTC “... contained numerous requests for variations to the product which were in addition to, or in excess of, the contents of the relevant Requirement Specification contained in the contract”;
- With respect to system specifications, OneLink claimed in July 1995 “... that it had been required by the PTC to carry out works outside the contract specification ... The outside specification works primarily related to aspects of the system which were included in the Functional Specifications [developed by OneLink] in excess of those requirements [previously agreed with the PTC] detailed in the Requirement Specifications”; and
- On the subject of commissioning tests:
 - In April 1997, OneLink contested that “the system is operating at a very high level of efficiency and only a very small number of inconsequential commissioning tests have not passed the PTC’s very rigid interpretation of those test results. There is therefore no reasonable basis upon which Phase 1 commissioning should not occur”; and
 - In May 1997, OneLink expressed its concerns at “... the perceived lack of urgency displayed by the PTC in reviewing the results of [re-testing of the accuracy of general ledger updates] considering the importance to both the PTC and OneLink in satisfactorily completing Phase 1 commissioning”. Shortly after, OneLink issued several notices to the PTC alleging delays caused by the PTC which had prevented achievement of Phase 1 commissioning by 21 April 1997.

6.34 Given the level of disputation surrounding phase 1 commissioning, the 2 parties sought independent expert determinations on 3 separate occasions in October 1996, November 1996 and May 1997. The issues upon which the parties consistently sought determination were whether phase 1 commissioning had been achieved by the revised milestone commissioning dates and, if not, whether OneLink was entitled to an extension of time. On each occasion, the independent expert found in favour of the PTC in that OneLink had not fulfilled its contractual obligations to enable phase 1 commissioning to occur.



6.35 Despite the substantial delays experienced with phase 1 commissioning, the PTC did not at any stage of the process issue to OneLink a “fundamental default notice” under the contract (such a notice is the first step in seeking termination of contractual arrangements). The PTC advised audit that its decision not to issue a fundamental default notice has been based on a mutual desire by the PTC and OneLink to progress implementation of the project. There was also a major risk that any action initiated to terminate the contract could result in prolonged and expensive litigation without significant benefit to either party.

6.36 In effect, in response to the 5 preliminary notices served by the PTC, as presented in Table 6C, the parties determined to resolve the issues by negotiating new contractual arrangements incorporating revised target commissioning dates. In the process, rights of the parties to pursue litigation arising from past actions were either waived or deferred.

Eventual agreement for November 1997 phase 1 commissioning

6.37 As stated in an earlier paragraph, phase 1 commissioning took place on 12 November 1997, some 33 months after the initial target date.

6.38 In the lead up to the decision to agree to phase 1 commissioning, a PTC Sub-Committee, which included representatives of the Departments of Infrastructure, Treasury and Finance and Premier and Cabinet, recommended in May 1997, that “... *such action is required to best ensure that the automated ticketing system is implemented in a cost effective and timely fashion. In making this recommendation, it was acknowledged that some risk remains in terms of OneLink’s delivery capability but that risk is not unacceptably high*”.

6.39 The above recommendation was not initially adopted by the PTC. A clear risk with the proposed course of action identified by the Department of Treasury and Finance was that if phase 1 commissioning was granted when not all pre-requisites had been satisfied, one of the PTC’s areas of commercial leverage under the contract, namely non-payment, was potentially removed.

6.40 Given these concerns, the PTC sought the opinion of various experts to gain additional assurance that the automated system warranted commissioning despite certain unfulfilled obligations of OneLink at that stage. The expert advice included:

- Engagement of an engineering computer expert involved in implementation of an automated ticketing project in Hong Kong. Upon review of the central processing system of the automated system, the expert proposed several recommendations for improvement but “... *found no reason to doubt data or system integrity*”; and
- An external consultant engaged by the PTC to assess the implementation of the fare collection project, who concluded that “... *the delays in implementing the system to date have been similarly experienced with all other systems implemented around the world*” and “... *the system features some of the highest performance standards in the world*”. The consultant advised that it was highly likely that similar problems with meeting milestones would also be experienced with any new service provider should the PTC terminate the contract with OneLink.

6.41 In addition to the above expert advice, the PTC took into account the continued enhancements made by OneLink over preceding months which had the effect of improving the overall performance of the automated system to the point that:

- with the exception of ticket vending machines aboard trams, all equipment was performing to essential service obligations levels;
- management reporting had improved in terms of information availability and provision of reports to the PTC, however, the accuracy and completeness of data remained a serious problem; and
- following several system software upgrades, the processing performed by the central computer system had become more efficient.

6.42 In view of the above factors, the PTC considered that OneLink had *“lifted their performance on the ground to an acceptable level ...”* and that it was *“... satisfied that the system has improved to a stage where it is prepared to move forward ...”*. Accordingly, it consented in November 1997 to phase 1 commissioning of the automated system.

6.43 Notwithstanding this significant decision by the PTC to approve phase 1 commissioning, a number of matters remained outstanding in relation to OneLink’s performance and reporting obligations outlined in the contract, namely:

- Disagreement existed between the 2 parties on whether processes and reports for cash to ticket sales reconciliations had been prepared in line with contractual requirements. It was resolved that an independent expert would be engaged to clarify contractual obligations (independent expert subsequently reported in April 1998: refer to comments in a later paragraph dealing with final commissioning issues);
- A contention by the PTC, disputed by OneLink, that obligations for reporting and management information had not been met in that reports required for 2 weekly reporting periods had not been delivered as required and/or reports delivered were neither materially complete nor contained appropriate data. (the independent expert referred to above was also engaged to clarify OneLink’s obligations);
- Failure by OneLink to achieve essential service obligations levels of performance for ticket vending machines located on trams. Commissioning testing of these machines disclosed 33 faults in the equipment installed during phase 1 of the project compared with an allowable total of 4 in order for essential service obligations levels to be achieved. Following these results, OneLink maintained that the allowable level of faults was too stringent. The PTC subsequently agreed to review the basis of performance for such machines and ultimately agreed to a considerable increase in the level of allowable machine faults from 90 to 216 for ticket vending machines installed in the total tram fleet without impacting upon compliance with the essential service obligations; and
- Continuing concerns by the PTC over the integrity of system data arising from an earlier review conducted by it in July 1997. This review, covering all 3 modes of public transport, highlighted significant discrepancies in system data concerning the accuracy of processing and recording of ticket sales and of validation transactions as well as an inability to reconcile cash banked for bus revenue and corresponding ticket sales.



6.44 Audit recognises that the PTC’s decision to grant phase 1 commissioning in November 1997 reflected expert advice and an improving performance by OneLink. However, a range of matters, particularly in regard to management information processing and reporting, remained unresolved between the 2 parties and required resolution prior to the final commissioning of the automated system.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

The Essential Service Obligation should be replaced by Approved Performance Standards. The PTC gained a valuable concession from OneLink Transit to encourage its improvement in the availability of tram vending machines.

Penalties have been applied to OneLink and will continue until these matters are satisfactorily delivered by OneLink Transit.

Final commissioning still to be achieved

6.45 As mentioned in an earlier paragraph, at the date of preparation of this Report, final commissioning of the automated system had not eventuated and was some 33 months behind the original contractual target of February 1996. This unsatisfactory position had arisen even though the parties had adopted 3 subsequent revised target dates, with August 1998 the latest target not achieved.

6.46 It can be said that all fare collection equipment has been installed on the transport system and, from the perspective of public transport users, the automated system would appear to be fully operational. Despite this appearance, final commissioning can only occur when both parties agree that the system is operating satisfactorily across the entire metropolitan transport network in line with performance standards and contractual obligations. Final commissioning also requires generation of complete and accurate management information under the system for the purpose of controlling fare revenue and monitoring public transport operations within the metropolitan area.

6.47 The PTC considers that final commissioning is dependent upon successful completion of commissioning testing which can only commence when the conditions as set out in the contract have been satisfied, that is “... *when the AFC system:*

- *is fully installed at the designated locations and the subject of all required acceptance certificates;*
- *is in revenue service where members of the public are purchasing tickets using that equipment or software and using those tickets by validating them with that equipment or software;*
- *is transferring information to and from station or depot computers and the central computer system;*
- *is meeting or is performing at levels above all essential service obligation levels;*
- *management and financial reports as specified within the contract are being provided for the periods agreed and, are materially complete and contain appropriate information; and*
- *cash to sales reconciliation is being performed in accordance with the contract”.*

6.48 At the date of preparation of this Report, the PTC advised that a range of matters, including those presented in Table 6D, required resolution by OneLink in order for the PTC’s commissioning testing to commence.

**TABLE 6D
MATTERS CURRENTLY REQUIRING RESOLUTION BY ONELINK TO
ENABLE COMMENCEMENT OF FINAL COMMISSIONING TESTING**

<ol style="list-style-type: none"> 1. Provision of cash to ticket sales reconciliation to the PTC in computerised form. 2. Ad-hoc reporting facility to be made available to the PTC. 3. Submission of timely and accurate management and financial reports as specified by the PTC. 4. Achievement of essential service obligation performance levels for the central computer and depot computer systems. 5. Need to demonstrate that the automated system in its entirety is operating at or above the required essential service obligation levels. 6. A requirement for tickets in the form of touchcards to comply with the specified contractual performance standards. 7. Rectification of operational problems carried forward from phase 1 commissioning including the inability of the system to allow tram drivers to log-on in certain circumstances, mismatching of equipment hardware and software serial numbers and an inability to track lost or stolen yearly tickets within the system. 8. Rectification of ticket problems including the validation of tickets outside the designated travel zone, recording of incorrect dates upon validation, non-acceptance of valid tickets at barriers and short trip ticket irregularities. 9. Access to the central computer system to be made available for multiple PTC users. 10. The implementation of 90 per cent of the retail agency network within the appropriate geographic areas. 11. Implementation of software necessary to prevent the purchase and validation of tram and bus tickets prior to the driver logging-on to the vehicles computer system. 12. Resolution of operational faults associated with the 2 hour by 10 Metcard for example of valid tickets.



6.49 In recent discussions with audit on the above outstanding matters, OneLink advised of action it had taken since phase 1 commissioning to implement a range of modifications aimed at improving the overall performance of the automated system. In this regard, it indicated that it has actively pursued continuous improvement activities. For example, attention had been directed towards minimising the level of equipment faults and a new central computer was recently installed.

6.50 The PTC recently advised audit that OneLink’s acceptance testing for the final commissioning phase has been completed and the PTC is currently verifying test results. The PTC also indicated it intends to undertake a physical and functional configuration audit of the automated system prior to final commissioning for the purpose of assessing the system’s functionality with specifications. The PTC considers such an audit to be critical given the significant number of system changes and software upgrades implemented by OneLink since phase 1 commissioning.

6.51 While the process to achieve final commissioning was underway at the date of preparation of this Report, the PTC was not in a position to determine when commissioning testing would commence, or to estimate when final commissioning of the automated system was likely to eventuate.

Need for improvement to management information and reporting facility

6.52 The financial management information facility within the automated system allows for the production of reports which can be automatically generated, manually requested on-demand, produced on-line or provided on an ad hoc basis. The content of the different reports varies from individual ticket transactions through to consolidated sales volumes and values for the entire public transport network.

6.53 Various representatives of the PTC’s 4 operating divisions indicated to audit that they were satisfied with the range of reports available but had significant concerns over the accuracy and completeness of the data. As such, they considered reports provided by OneLink to date were of limited value and did not serve as an effective business tool. Specific problems advised to audit included:

- a significant number of reports were never delivered (i.e. are lost in processing);
- many reports provided to the PTC were incomplete particularly in regard to missing data related to previous months;
- delays in the delivery of reports of up to 48 hours have been experienced;
- the ad hoc reporting facility was not considered user-friendly; and
- users cannot always gain access to the manual reporting function.

6.54 Despite the fact that the automated system has been under development for over 3 years, a key objective of providing a range of management information critical to controlling public sector transport operations and for effective planning has still not been met. It is obviously important that current problems be rectified in a timely manner to enable final commissioning to proceed.

Importance of rectifying problems with reconciling ticket sales to cash received

6.55 Cash to sales reconciliation involves matching all ticket sales as recognised at the point-of-sale to total collected cash or cash equivalent (e.g. EFTPOS). The contractual requirements stipulate that the reconciliation must be system-generated and that the financial data contained within the reconciliation is to be 100 per cent complete and accurate. The absolute precision required in this area is derived from the critical importance of the PTC having total confidence in the integrity of daily sales revenue. The Government's planned privatisation program for public transport will also lead to increasing reliance placed on the integrity of data on revenue collections in order to facilitate accurate allocation of revenue to individual private operators.

6.56 To date, several major problems have been experienced by OneLink in achieving cash to sales reconciliation including:

- the inability of the automated system to generate a complete and accurate report which reconciles system-wide cash from ticket sales to sales records;
- a significant shortcoming in the central computer system in that it cannot precisely identify money held in ticket machines when unscheduled ticket machine opening occurs due to maintenance and other circumstances; and
- the absence within reports of reliable information on cash in transit which reflects cash held by retail agencies not connected to the central computer system.

6.57 The seriousness of these weaknesses is reinforced by the fact that daily fare revenue is in the vicinity of \$700 000. The unsatisfactory circumstances have meant that both the PTC and the Government (in the lead-up to its impending privatisation strategy) have been forced to place a higher level of reliance on passenger surveys to gain a degree of assurance as to revenue collected for the various modes of transport.

6.58 In view of the limited reliance that could be placed upon computer generated reconciliations, OneLink has been required to manually perform cash to sales reconciliations on an ongoing basis. The most recent advice provided by the PTC to audit was that, as at September 1998, OneLink's cash to sales reconciliation process was still not in accordance with contractual requirements and therefore remained a key matter requiring resolution prior to final commissioning.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

Irrespective of the Government's privatisation program, there is a requirement for a high integrity of data on revenue collection by PTC.

Previously PTC allocated revenue on the basis of the point of sale whereas from the 1 July 1998 revenue allocation has been taken on the basis of survey data which will be supplemented by data from the Automated Ticketing System when it becomes fully commissioned.



Expression of audit opinion on PTC's 1997-98 financial statements

6.59 As the automated system at 30 June 1998 was neither fully operational nor commissioned, verification by the Auditor-General of the PTC's fare revenue collected during 1997-98 via the automated fare collection system (around \$96.6 million or 38 per cent of total revenue) operated by OneLink, required the following additional audit procedures:

- a review of controls associated with both the cash settlement and ticket distribution processes in order to assess reliability of the functions; and
- review and re-testing of work performed by the PTC's internal auditors in relation to the system's cash collection and banking processes, manual cash to sales reconciliation, float management reconciliation and ticket stock issues.

6.60 In expressing a confirming opinion on the PTC's 1997-98 financial statements, the Auditor-General also provided the following comment, "*As disclosed in note 2a to the financial statements, the automated ticketing system was neither fully operational nor commissioned for the year ended 30 June 1998. As a consequence, the PTC has not relied upon all aspects of the system and has used additional procedures, which have been verified by audit, for the purpose of monitoring metropolitan passenger revenue. Accordingly, the audit does not provide assurance in relation to all aspects of the automated ticketing system.*"

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

PTC believes that, for completeness, reference should be made to the Audit opinion that the accounts do fully and properly represent the financial position of the PTC for the 1997-98 period.

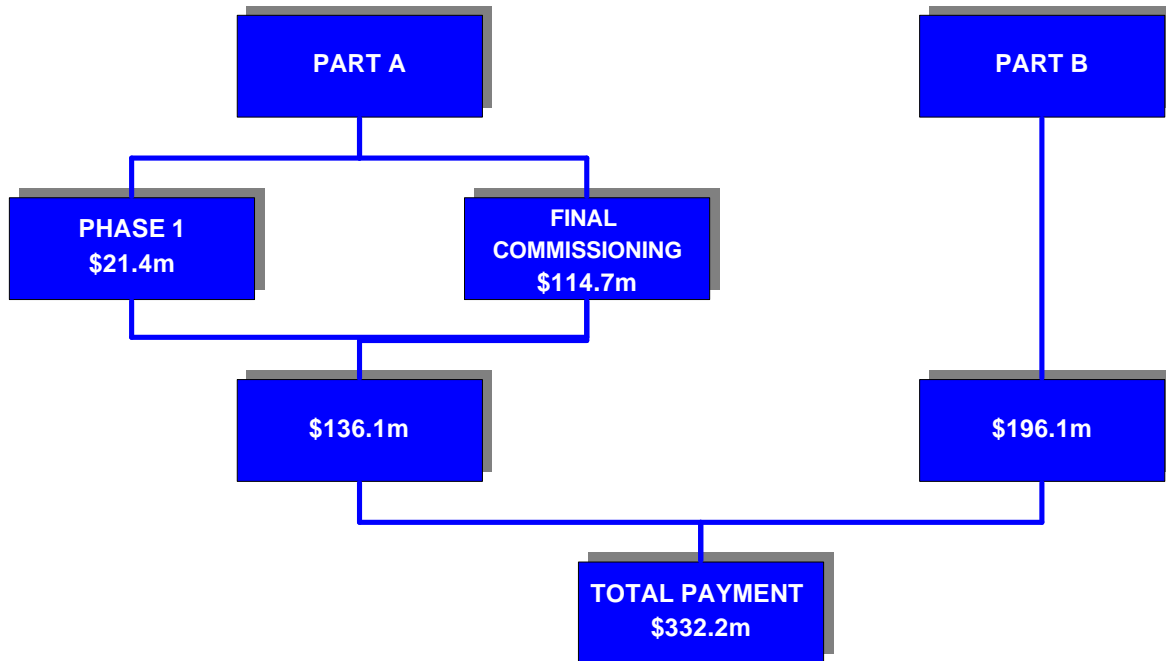
CONTRACTUAL PROVISIONS FOR PAYMENTS TO ONELINK

6.61 The major principles established within the contract governing payments to OneLink are:

- no obligation for the PTC to commence any payments until completion of phase 1 commissioning;
- payments to OneLink in excess of amounts due following phase 1 commissioning to be increased on a pre-determined basis in direct proportion to the extent of further equipment progressively installed and in operation;
- full service payments of around \$36 million per year to OneLink for operating and managing the entire automated system not to commence until after final commissioning has been achieved;
- a right of the PTC to withhold up to \$100 000 due to OneLink for every week by which the final commissioning date is not achieved; and
- a range of bonus (to OneLink) and compensation (to the PTC) payments based upon potential gains and losses in PTC fare revenue where performance deviates from specified standards.

6.62 Payments to be made to OneLink over the period of the contract, excluding potential bonuses and compensation payments, total around \$332 million. These payments have been structured within the contract under 2 categories, as illustrated in Chart 6E.

CHART 6E
CONTRACTUAL PROVISIONS FOR PAYMENTS TO ONELINK
 (\$ million)



Source: Contract between the PTC and OneLink.

6.63 The *Part A* payments, totalling \$136.1 million, relate to the design, development, installation, commissioning and financing of the overall fare collection project. Of this amount, payments are to be made progressively over the term of the contract as follows:

- quarterly payments, which commenced in November 1997 following phase 1 commissioning, totalling \$21.4 million; and
- periodic payments amounting to \$114.7 million, starting from the date of final commissioning.

6.64 The second category, *Part B* payments, which total \$196.1 million, cover expenses directly incurred by OneLink in operating the automated system. They include marketing, ticket production and distribution, telecommunication and cash counting costs together with system management fees.



6.65 Table 5B within Part 5 of this Report showed that an amendment to the contract, signed between the 2 parties in November 1997, dealt with the timing of progressive payments to OneLink. Under this amendment, the PTC agreed to pay OneLink on a monthly rather than quarterly basis until the then revised target date for final commissioning of June 1998. The PTC advised audit that it had agreed to this amendment in order to assist OneLink with cash flow management until it became eligible to receive full payments under the contract. As a consequence of the increased frequency of progressive payments, the PTC required budget supplementation and received a Treasurer’s advance of \$3.8 million during 1997-98.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

The increased frequency of progressive payments was discounted to effect no increase in cost to the Government. This supplementation also accommodated increased marketing expenditure during the introductory phase.

Impact of delays on payments to OneLink

6.66 In line with the above contractual principles, payments to OneLink did not commence until phase 1 commissioning occurred in November 1997. Payments made to OneLink between this date and 30 September 1998 have totalled around \$17 million.

6.67 Once the automated system is fully commissioned and ongoing services are delivered to the satisfaction of the PTC, OneLink will receive payments amounting to \$9.3 million per quarter reflecting both Part A and B payments, subject to potential adjustments arising from any compensation and bonus payments.

6.68 The delays of 33 months which occurred before phase 1 commissioning was achieved and the fact that final commissioning of the system is yet to eventuate have had a major impact on the amount payable to OneLink to date. Audit calculations revealed that, in comparison with the \$17 million paid to 30 September 1998, OneLink would have been entitled to receive a total of \$107 million by that date if both phases of commissioning had been achieved by the target dates agreed by the parties under the 1994 contract. In effect, this situation has meant that OneLink has been required to finance the major part of its operations for a period of 2 and a half years in excess of that originally intended under the contract.

6.69 Also, as a result of delays in achieving phase 1 commissioning, almost \$500 000 in relation to late commissioning penalties and non-conforming items, have been forfeited by OneLink. In addition, the PTC has the right to withhold the amount stipulated in the contract of up to \$100 000 per week from payments due to OneLink because of the non-commissioning of the total automated system. Although ongoing deductions have occurred, quantification of these amounts is not practicable as the PTC is yet to reach agreement with OneLink on the final amount to be withheld under the relevant terms of the contract.

6.70 It can be seen that incorporation within the contract of provisions linking payments to the achievement of required commissioning milestones has provided significant financial protection to the PTC and, in turn, taxpayers against OneLink not meeting its contractual obligations. In addition, this type of contract has provided a major incentive to OneLink to continue to strive to satisfactorily complete the contract in order to receive full payment, notwithstanding the delays and difficulties and forfeiture of moneys which have already occurred.

Potential for additional payments due to “scope creep”

6.71 The first major amendment to the contract which occurred in September 1995 (the Collateral Agreement) clarified the entitlement for OneLink to submit claims for “scope creep”. In simple terms, this contractual provision relates to increases in costs which OneLink considers have arisen from changes in the scope of the automated system from that initially envisaged, and in the system’s underlying specifications developed by OneLink and agreed to by the PTC in August 1995. In line with due process, any claims furnished by OneLink under this provision are conditional upon acceptance by the PTC.

6.72 The second major amendment to the contract in March 1997 provided inter alia for an important financial quantification of the extent of claims which may ultimately be allowed to OneLink for scope creep variations. This amendment introduced a “cap” of \$30 million (or \$35 million if the PTC elects to enter an extended dispute resolution period). This cap only applies to variations of a capital nature and OneLink can also submit separate claims under other provisions of the contract for any additional operating costs arising from any approved capital variations.

6.73 Examination by audit of relevant documentation held by the PTC indicated that it was the PTC’s initial intention to establish the cap in the region of \$20-\$25 million. The PTC was not able to justify to audit the basis for its intended limit of up to \$25 million or its decision to subsequently agree to an increase to \$35 million.

6.74 By the introduction of a variation claim cap, the PTC has sought to limit its exposure while retaining the right to contest any claims lodged by OneLink. However, based on specialist advice, audit considered that the established cap of up to \$35 million, representing up to 42 per cent of the total capital equipment value for the automated system of \$83 million, was excessive.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

As stated previously the establishment of a cap limited the maximum amount claimable by OneLink where previously there had not been a limit. A quantum of \$35m was a negotiated maximum below the amount sought by OneLink at the time. The PTC queries the basis of the specialist advice referred to and in particular the assumptions on which that specialist advice has been provided.



Extent of variation claims submitted by OneLink to date

6.75 The March 1997 amendment to the contract also changed the way in which “scope creep” claims are to be submitted by OneLink in that it needs only to prove its 4 major claims in specific detail to justify that there is a sound basis for submitting variation claims. The balance of any remaining claims still require extensive details to be provided but to a lesser degree.

6.76 The PTC advised audit that the purpose of requiring a higher level of detail for OneLink’s 4 major claims was to enable the PTC to assess the merits of such claims and thus determine whether or not it was appropriate to negotiate a commercial settlement of all variation claims and the level of associated compensation. This process also avoids what can be an extensive cost to both parties in proving every individual claim.

6.77 To date, OneLink is yet to submit details of its 4 major claims to the PTC. However, up to August 1998, it had submitted 242 variation claims in relation to the implementation of the fare collection project generally. Of these, 99 claims valued at \$3.8 million had been accepted, 101 claims costed at \$8.5 million were not approved and the remaining 42 claims are still to be costed by OneLink. It is also possible that OneLink will submit further claims to the PTC when final commissioning is approved.

6.78 In effect, an assessment of the total value of claims likely to be submitted by OneLink cannot be made at this stage as, even with those claims already lodged, many are yet to be costed by OneLink and considered by the PTC. Nevertheless, it is possible that the final cost to the PTC of the automated fare collection system contract, which was initially valued at \$332 million, could extend by the value of the cap to around \$367 million, without taking into account any other variation claims agreed between the parties.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The conclusion drawn in this paragraph is based on the assumption that the value of the scope creep claims is accepted by the PTC at \$35 million. The PTC has not accepted that the value of any such scope creep claims will amount to \$35 million.

Part 7

Monitoring the performance of the automated system

OVERVIEW

7.1 During 1996, OneLink proposed to the PTC that specifications be developed for a “performance reporting system” which would be used to monitor and report on the performance of key system components or activities against the approved performance standards specified in the contract. However, at the date of preparation of this Report, the PTC had not given its approval to the performance reporting system proposed by OneLink due to ongoing concerns about the integrity of the performance information generated by the system. In effect, until these concerns are resolved, the PTC will not be in a position to effectively monitor the performance of the system.

7.2 The PTC has, over the past 12 months, put in place its own quality assurance mechanisms which are designed to give it confidence over the operation of the automated system and the performance data reported by OneLink. The specific actions undertaken by the PTC have involved system integrity reviews, the maintenance of an incident database to record reported faults with system equipment and the conduct of quality assurance examinations.

7.3 The results of the system integrity reviews indicated to the PTC that OneLink’s reporting system could not, at the time of the reviews, be relied upon to produce timely, accurate and complete management information. Accordingly, the PTC concluded that significant effort was still required by OneLink in order to bring the quality of its transaction processing and performance reporting output up to the high standard necessary to enable final commissioning.

7.4 The incident database to date has proven to be a highly effective tool in monitoring system performance and as a means of independently verifying OneLink’s performance data, particularly in relation to equipment availability, downtime and vandalism incidents. However, its overall value is limited to the extent that it is reliant on PTC staff, for example tram drivers, and members of the public to advise of equipment faults. Accordingly, the real level of equipment faults is likely to be understated in the database. It must also be recognised that if OneLink’s performance reporting system was operating satisfactorily there would not be a need for the expense and effort involved in the PTC maintaining this database which in effect duplicates the information which should be provided by the OneLink system.

7.5 The PTC is yet to be satisfied with the accuracy of OneLink reports on the performance of the system in comparison with contractual standards and targets. Apart from doubts as to the reliability of the information generated from the system, it was clear from available data that OneLink’s response to equipment breakdowns had deteriorated. In January 1998, OneLink was responding to in excess of 90 per cent of equipment calls within 1 hour whereas in July 1998, the level of response had reduced to only 45 per cent. Delays in responding to equipment breakdowns may have an impact upon PTC revenue.

PERFORMANCE REPORTING SYSTEM AND DATA INTEGRITY

Delay in formal approval of performance reporting system

7.6 One of the important contractual obligations of OneLink, referred to in Part 5 of this Report, involves the development of suitable management information and communications systems for the overall project.

7.7 During 1996, OneLink proposed to the PTC that specifications be developed for a “performance reporting system” which would be used to monitor and report on the performance of key system components or activities against the approved performance standards specified in the contract. Details of these standards and their impact on the amount of remuneration payable to OneLink were also outlined in Part 5.

7.8 At the date of preparation of this Report, the PTC had not given its approval to the performance reporting system proposed by OneLink due to ongoing concerns about the integrity of the performance information generated by the system. In Part 6, audit identified that rectification of the problems experienced by OneLink in producing complete and accurate management information must occur before final commissioning can be achieved.

7.9 The ongoing concerns of the PTC in relation to OneLink’s performance reporting system relate to:

- The absence of effective safeguards to protect data dealing with equipment faults during periods of power loss;
- A need to clearly define whether faults can be attributed to OneLink or are outside its control;
- Situations where ticket machines run out of change and the PTC considers the machine to be out of service. However, OneLink considers the machine as operable notwithstanding that the commuter is not able to retrieve change; and
- The lack of accurate automatic reporting of certain fault conditions which has necessitated the need for OneLink to manually adjust system reports, a position deemed unsatisfactory by the PTC.

7.10 Until these concerns are resolved, the PTC is not in a position to effectively monitor the performance of the automated system.

7.11 In view of the above circumstances, in August 1998, the PTC appointed its internal auditor to undertake a review of OneLink’s reporting system in order to determine whether the processes of capturing, logging and recording of system equipment faults were operating effectively and could now be relied upon for the purpose of monitoring OneLink’s performance. The initial results of the internal auditor’s review disclosed a number of errors in the classification of equipment faults in OneLink’s reporting system. Accordingly, there remained a number of issues which require resolution before the reporting system can be fully relied upon.



Action taken by the PTC to evaluate the integrity of performance data provided by OneLink

7.12 The previous paragraphs focused on the work undertaken by OneLink in developing a performance reporting system. In tandem with OneLink’s activities, the PTC has, over the past 12 months, put in place its own quality assurance mechanisms which are designed to give it assurance over the operation of the automated system and the performance data reported by OneLink. The specific actions undertaken by the PTC have involved system integrity reviews, the maintenance of an incident database and the conduct of quality assurance examinations.

System integrity reviews

7.13 The PTC has conducted 3 system integrity reviews which involve the verification of data as it is processed through the system. The reviews have consisted of:

- purchasing and validating a sample of tickets on all modes of transport, including the purchase of tickets from retail agents, and verification that the transactions have been correctly recorded on OneLink’s central computer system; and
- confirming the accuracy of processing of the transactions, in terms of banking of proceeds from ticket sales, EFTPOS processing and equipment faults, by reference to management reports generated by OneLink.

7.14 Generally, the results of the 3 reviews conducted to date have led to significant concerns by the PTC about the processing capability of the automated system in that an unacceptably high proportion of the information on ticket purchase and validation transactions could not be traced to reports generated by the system.

7.15 The most recent system integrity review conducted in March 1998 involved the review of the end-to-end processing of tickets purchased from the 3 modes of transport and retail agents over the month of March 1998.

7.16 The results of this review clearly indicated to the PTC that, at that time, the system could not be relied upon to produce timely, accurate and complete management information. Accordingly, the PTC concluded that significant effort was still required by OneLink in order to bring the quality of its transaction processing and performance reporting output up to the high standard necessary to enable final commissioning.

Maintenance of an incident database

7.17 Since May 1996, the PTC has maintained an *Incident Database* which records information on faults associated with the operation of the automated system. The database was established following concerns by the PTC as to the quality and level of performance information progressively provided by OneLink. Database information is provided to the PTC by station staff and bus drivers and, via the PTC’s Automatic Vehicle Monitoring system in relation to trams. At the present time, the database contains around 43 000 recorded incidents ranging from equipment out of service on account of vandalism or not functioning correctly.



7.18 The PTC currently utilises the information within the database for the following purposes:

- as a means of cross-checking the detailed information in relation to equipment faults provided by OneLink;
- for the provision of trend data and management reports to the PTC’s operational business units; and
- to support the PTC’s customer service officers in their revenue protection activities.

7.19 The responsibility for rectifying any identified problems with equipment or other system components rests directly with OneLink.

7.20 While audit considers that this database is a valuable management tool for the PTC, its value is limited to the extent that it is reliant on its own staff, e.g. tram drivers, and members of the public to advise of equipment faults. As an illustration, for unstaffed rail stations, unless the PTC is informed by commuters of an equipment fault, it is not likely to record the incident. Accordingly, the real level of equipment faults will be understated in the database.

7.21 Nevertheless, the incident database to date has proven to be a highly effective tool in monitoring system performance and, as a means of independently verifying OneLink’s performance data particularly in relation to equipment availability, downtime and vandalism incidents. However, it must be recognised that if OneLink’s performance reporting system was operating satisfactorily there would not be a need for the expense and effort involved in the PTC maintaining this database which in effect duplicates the information which should be provided by the OneLink system. This situation places increased emphasis upon OneLink to upgrade the system to the standard expected by the PTC.

Quality assurance examinations

7.22 Since 1995, the PTC has undertaken a number of examinations to assess OneLink’s performance against requirements for quality management stipulated within the contract. For this purpose, OneLink has developed a quality plan which places emphasis upon such activities as design and document control, inspection and testing, final commissioning processes, and transition from project development to management of ongoing operation of the automated system. In 1996, following a review of the plan, the PTC reported that “*most procedures in the plan appear to be in place and operational*”. Audit was advised by the PTC that quarterly reviews of OneLink’s quality plan are scheduled to be undertaken over the next 12 months.

Impact of system problems on assessment of OneLink's performance since phase 1 commissioning

7.23 As mentioned in Part 5 of this Report, OneLink is required, after commissioning, to meet the performance standards specified under the contract in order to receive full contractual payments. With the achievement of phase 1 commissioning in November 1997, it therefore became necessary for the PTC to be satisfied as to the performance levels attained by OneLink in order to calculate the level of payments due to OneLink (inclusive of any bonus payments covering over-performance or deductions to compensate for any under-performance).

7.24 Initial performance data on phase 1 equipment was submitted by OneLink to the PTC in April 1998 and covered the 2 week period, 15 to 28 February 1998. This data was limited to information related to the functioning of the automated system's equipment. Despite ongoing requests by the PTC for information from OneLink on other aspects of the system including ticket media, customer liaison and management information and communication systems, the information has only recently been forthcoming. The PTC advised audit that this situation was attributable to the unresolved system problems experienced by OneLink as outlined in the earlier paragraphs.

7.25 Because of concerns expressed by the PTC with the integrity of the information, the data previously furnished was withdrawn by OneLink and resubmitted in June 1998. However, after further examination, the PTC again expressed concerns regarding the reliability of the data resubmitted by OneLink. As a direct consequence, the PTC has not been in a position to be satisfied that OneLink was meeting the established performance standards.

7.26 In an attempt to gain some assurance over the level at which the automated system was operating, the PTC undertook its own analysis of OneLink's performance data following which it concluded that key phase 1 equipment across all modes of transport was operating at availability levels above essential service obligations, but below approved performance standards.

7.27 It is critical that every effort be made by the parties to ensure that performance data can be determined with precise accuracy given the magnitude of remuneration payable to OneLink and that any payments based on unreliable performance data could result in significant under or over payments by the PTC.

MONITORING OF MAINTENANCE RESPONSE TIMES

7.28 A matter which requires close scrutiny by the PTC in the monitoring of equipment availability performance data is the speed of response by OneLink to equipment unavailable due to breakdown or vandalism. The extent of downtime due to equipment breakdowns and the time taken to effect repairs can have a marked impact on PTC revenue.

7.29 The contract specifies that, in relation to all vending and validation equipment other than tram ticket vending machines, OneLink is to provide a maximum response time of one hour from the time of notification of a fault to the central computer system.



7.30 For vending equipment located on trams, which is not linked to the central computer system, the response time is 30 minutes from notification of the fault with a further 5 minutes to rectify the fault. If the fault can be rectified in this timeframe, it is to the advantage of OneLink in that a fault is not recorded in the system.

7.31 Concerns were expressed to audit by management of PTC’s operational units in relation to the rectification of faults by OneLink in that:

- response times for relevant system equipment, although somewhat improved over recent months, were generally not occurring within the one hour performance standard required by the contract; and.
- considerable time and revenue are lost and disruption to timetables occurs as a result of trams with faulty vending equipment having to return to depots for equipment repairs.

7.32 The importance of responding quickly to faults can be evidenced by the high level of equipment breakdowns which are occurring with vending machines on trams. Based on information reported by OneLink, at the end of July 1998, of the 465 ticket vending machines installed in trams there were 1 047 responses by OneLink technicians during the month, comprising almost half of the total monthly service calls in relation to tram equipment.

7.33 Audit was unable to establish the full extent of equipment problems due to doubts as to the reliability of the information generated from the automated system as referred to previously. However, in its June-July 1998 progress report to the PTC, OneLink revealed that the level of response time in relation to system equipment has significantly deteriorated. The report indicated that in January 1998 OneLink was responding to in excess of 90 per cent of equipment calls within one hour whereas in July 1998 the level of response had reduced to only 45 per cent.

7.34 In the Progress Report, OneLink advised that “... *additional focus is still required to achieve the required level with actions to date not having the pronounced impact required. This is expected to improve over the coming weeks with the full focus of the maintenance team directed to improving the call out response times*”. The PTC has advised audit that action taken by OneLink very recently has significantly improved response times for equipment faults.

7.35 As with the other matters discussed in earlier paragraphs involving OneLink’s performance, there is an obligation on OneLink to fulfil its contractual responsibilities to meet response times agreed to with the PTC, particularly given the implications in this instance on the PTC’s fare revenue and ability to meet scheduled timetables for trams.



Current performance levels reported by OneLink

7.36 The June-July 1998 progress report submitted by OneLink to the PTC, the accuracy of which is yet to be accepted by the PTC, present OneLink’s perspective on its overall performance. The report conveys the contractor’s view that all essential service obligation levels have been achieved and around 50 per cent of the higher-level approved performance standards have either been achieved or exceeded.

7.37 In the absence of the PTC formally approving OneLink’s performance reporting system and the concerns it has expressed over the accuracy of performance reports submitted by OneLink over recent months, as outlined in previous paragraphs of this Report, the PTC advised audit that it cannot positively verify the accuracy of this performance information.

Part 8

Public image of the automated system

OVERVIEW

8.1 The fact that the entire automated fare collection system has been utilised by the public for less than 12 months and has yet to be finally commissioned creates difficulties in providing a definitive assessment of the level of public awareness and acceptance of the automated system including its impact upon the quality of transport services. However, drawing on specialist assistance, audit undertook 2 market surveys in May and August 1998 and held discussions with special user groups to ascertain public views on the system.

8.2 Some of the key characteristics of metropolitan public transport users who responded to the 2 surveys were:

- around 48 per cent claimed to use public transport at least once a week;
- the daily ticket was the most popular ticket and was used by around half of the respondents, while the 2 hour ticket was the next most popular; and
- trains represented the most commonly used form of public transport followed by trams and buses.

8.3 Overall, public transport travellers were becoming more accustomed to the new automated system over the time between the 2 surveys although, by August 1998, 44 per cent of respondents indicated that they had still not seen or heard of any information about the system. Also, some continuing problems were cited such as faults with vending and validation machines and passenger queues during peak travel periods.

8.4 Over 25 per cent of respondents in the second survey considered that the new automated system has resulted in a better quality of service for the public transport user. This shows a slight increase on the result from the survey in May 1998 of 18 per cent. In contrast, a large percentage of respondents to both surveys, 48 per cent in August and 54 per cent in May, had the perception that introduction of the system had decreased the quality of service. Given these results, it is clear that the PTC still has a major task in marketing the system to public transport users.

8.5 The level of users who reported that machines were either always, frequently or sometimes broken down (46 per cent) or that validating machines were not working (37 per cent) is a major concern for the PTC. The PTC should conduct further investigations of these views as equipment failure is likely to result in users not purchasing and validating tickets. Such occurrences can significantly impact on PTC fare revenue.

8.6 Around 79 per cent of users in both surveys claimed that the introduction of the new automated system would either not influence or positively influence their future usage of public transport. However, the implications to the PTC's fare revenue base would be serious if the 18 per cent who stated that they would be less likely to use public transport actually sought alternatives to public transport at some stage in the future. Whether this scenario would eventuate is uncertain. Nevertheless, it places emphasis on the PTC ensuring that the system is working with maximum effectiveness from the viewpoint of the travelling public as soon as possible.



OVERVIEW - *continued*

8.7 Community groups representing the elderly and the disabled expressed to audit a number of specific concerns regarding the suitability of the automated system. A ministerial working party, in its June 1998 report, has made recommendations aimed at addressing many of these concerns, however, no action has been taken to date. In conjunction with the long-delayed introduction of touchcard technology, seen as pivotal to meeting many of the needs of the elderly and disabled, early implementation of these recommendations would satisfy many of the concerns of the user groups and could lead to increased patronage of public transport.

8.8 Under the contract, OneLink is responsible for all public education and marketing functions associated with the automated system. While a preliminary marketing plan was initially used by OneLink, this plan was of limited usefulness because of its very broad nature and the absence of performance measures to evaluate the effectiveness of marketing activities. It was not until 1997, 3 years after the signing of the contract, that OneLink developed a comprehensive marketing plan. The most recent market research undertaken by both OneLink and the PTC on the marketing plan revealed that most objectives set out in the plan are still to be achieved. This situation, when viewed in conjunction with the results of the audit surveys, indicates a need for more effective public education strategies in the future.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

PTC's fault database and reports from business operators indicate that there have been significant reductions in reported faults.

PTC believes that it is extremely unlikely that the AT system would significantly adversely affect usage of public transport. PTC believes that acceptance of the automated fare collection system will increase as passengers become increasingly accustomed to it and equipment reliability improves. Nonetheless PTC is concerned to ensure that the system works with a maximum effectiveness from the travelling public's perspective.

PTC acknowledges the recommendations made by the Ministerial Working Party and together with the business operators is working to implement these recommendations where possible. PTC is continuing to test the Touch Card technology and when it is satisfied that it is sufficiently robust, will extend its trials to include representatives of community groups prior to its full implementation.

DETERMINING THE PUBLIC'S ASSESSMENT OF THE AUTOMATED SYSTEM

8.9 The fact that the entire automated system has been utilised by the public for less than 12 months and has yet to be finally commissioned creates difficulties in providing a definitive assessment of the level of public awareness and acceptance of the system, including its impact upon the quality of transport services provided.

8.10 Audit determined that it would be useful to seek feedback from members of the public during their early experiences with the automated system to ascertain from the perspective of commuters the extent to which the Government's objectives and broad expectations of the system are being met.

8.11 In order to form a view on the public image and extent of use of the automated system, audit utilised a variety of techniques including:

- the conduct of 2 market surveys drawing on the services of a specialist market analyst;
- discussions with PTC management and staff, and review of processes and documentation maintained by the PTC, including material related to public education programs; and
- consultation with various user and community groups, such as the elderly and disabled, and of union representatives through discussions and focus groups.

Methodology utilised for market surveys

8.12 In seeking public views, particular emphasis was given in the surveys to:

- travellers' reactions to ticket purchasing;
- the ease of use of automated ticketing and validating machines;
- the success of public education strategies to prepare users for the implementation of the revised fare collection arrangements; and
- whether the new automated system is likely to influence the public's future usage of public transport.

8.13 The surveys were undertaken in 2 stages, with the first survey conducted in May 1998 and the second in August 1998.

8.14 As a means of obtaining a representative sample of public transport users across metropolitan Melbourne, telephone surveys were employed. A total sample size of 1 400 public transport users was determined by the specialist.

8.15 In order to establish accurate and comparative purposes between the 2 surveys, the same sample was used in the second survey. Out of the initial 1 400 people surveyed in May 1998, a total of 1 067, or 76 per cent, were able to be contacted for re-interview during the second phase in August 1998.



8.16 Some of the key characteristics of metropolitan public transport users who responded to the 2 surveys were:

- around 48 per cent claimed to use public transport at least once a week;
- the daily ticket was the most popular ticket used by around half of the sample (49 per cent, August 1998 and 53 per cent, May 1998), while the 2 hour ticket was the next most popular ticket purchased (29 per cent, August 1998 and 27 per cent, May 1998); and
- trains represented the most commonly used form of public transport followed by trams and buses.

8.17 The August 1998 survey was expanded to also incorporate responses from a sample of 200 “non-metropolitan” users of Melbourne’s public transport. The purpose of this action was to ascertain the views of tourists and other visitors to Melbourne on the ease of use of the automated system.

8.18 Of the non-metropolitan users surveyed:

- approximately 20 per cent were from interstate and 14 per cent from overseas;
- 76 per cent had travelled on a train, 67 per cent on a tram and 22 per cent on a bus in the week prior to the survey; and
- despite residing outside Melbourne, almost a third claimed to use the metropolitan public transport system on a weekly basis.

OVERALL CONCLUSIONS FROM MARKET SURVEYS

8.19 The purpose of audit undertaking 2 market surveys involving the same respondents was to determine whether there was any evidence of an increasing trend towards greater public awareness of the automated system.

8.20 The results of the 2 surveys have been extensively discussed with the PTC. During these discussions, the PTC advised that it regarded the information arising from the surveys to be useful and indicated that it intended to use the results as complementary to information already obtained from its past surveys.

Public awareness of the automated system

8.21 By August 1998, the time of the second survey, 52 per cent of Melbourne’s resident public transport users claimed to have seen or heard information about the introduction of the new automated system. This result reflected an increase of 13 per cent in awareness from the level of 42 per cent in the initial May 1998 survey. In both surveys, approximately 75 per cent of those aware of information regarding the system declared their satisfaction with this information.

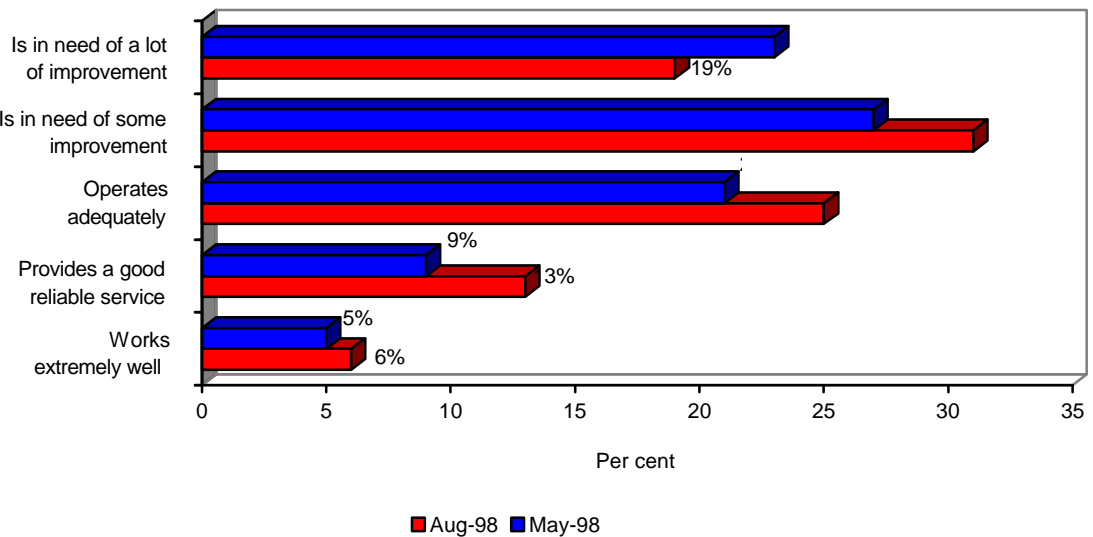
8.22 By the time of the second survey, 59 per cent of users advised that they had no problems with using the ticket vending and validation machines compared with 54 per cent in May 1998. Conversely, 38 per cent of users remained either a bit unsure or didn’t know how to use the automated system.

8.23 In general, public transport travellers were becoming more accustomed to the new automated system over the time between the 2 surveys, although some problems were recurrent such as faults with vending and validation machines and queues during peak periods.

User satisfaction with the automated system

8.24 By the time of the second survey, the overall level of user satisfaction with the automated system appeared to be rising although, as outlined below, there remained a material number of respondents who considered that the system required some or substantial improvement.

Based on your experience, which of the following statements best describes the current status of the new ticketing system?



8.25 The second survey checked whether respondents had a ticket for their last public transport journey. It transpired that 9 per cent of travellers had not bought a ticket. This proportion rose to 15 per cent of people whose last journey was by tram. This finding indicates a high level of fare evasion which is further discussed in later paragraphs.

8.26 Just over a quarter of respondents in the second survey considered that the new automated ticketing system has resulted in a better quality of service for the public transport user. This shows a slight increase on the result from the survey in May 1998. In contrast, a large percentage of respondents to both surveys, 48 per cent in August 1998 and 54 per cent in May 1998, perceived that the introduction of the system had led to a reduction in the quality of service. Given these results, it is clear that the PTC still has a major task in marketing the system to public transport users.



8.27 Around 79 per cent of users in both surveys claimed that the introduction of the new automated system would either not influence or positively influence their future usage of public transport. The implications to the PTC’s fare revenue would be serious if the 18 per cent who stated that they would be less likely to use public transport actually sought alternatives to public transport at some stage in the future. Whether this scenario would eventuate is uncertain. However, it places emphasis on ensuring that the system is working with maximum effectiveness from the viewpoint of the public as soon as possible.

8.28 More detailed analysis of the results of the market surveys undertaken during the audit are incorporated in the following paragraphs.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The surveys were conducted at an early stage of the automatic ticketing system's introduction. Subsequent to the surveys there have been significant improvements in equipment availability and the availability of MetCard retail agents. Also since that time, the MetCard 2 hour x 10 ticket has been introduced. This ticket represents a substantial discount over 10, 2 hourly tickets.

It should be pointed out that tickets purchased on a tram are validated by the ticket vending machine and therefore do not require validation on the tram unless the passenger changes vehicles. The fact that the ticket has not been validated does not therefore necessarily indicate fare evasion. The survey did not ask respondents their reasons for non-purchase – some may have pre-purchased a ticket and some may have been travelling on concession (approximately 50% of the public transport users are concession holders).

As acknowledged in paragraph 8.68, passengers consider that quality of the service has improved. It is expected that, with the increasing availability of equipment and passenger familiarisation with the system, the perceptions of the quality of the system will continue to improve.

It is dangerous to imply that 18% of passengers are likely to seek alternatives to public transport due to the introduction of the AT system. There is no evidence of patronage losses due to the introduction of this system.

LEVEL OF USER AWARENESS OF THE AUTOMATED SYSTEM

Assessing the adequacy of OneLink’s public education and marketing strategies

8.29 A key requirement for successfully implementing any major change to methods of service delivery is ensuring, through education and marketing, a high level of understanding and acceptance of the change by users of the service.

8.30 In the case of the automated fare collection system, this public education is of even greater importance to the ultimate success of the automated system given the significant change in ticket purchasing culture required of users. A failure to achieve public acceptance and knowledge of the system would increase the risk that anticipated outcomes would not be achieved and revenue of the PTC could be adversely affected.

8.31 From the very beginning of the automated system project, the PTC envisaged that education and marketing would be of key importance to the successful implementation of the system and a demonstrated capacity to effectively market the system was given a high priority during the tender evaluation process.

8.32 Under the total management concept embodied within the contract, responsibility for all education and marketing activities associated with the project was assigned to OneLink. Its specific marketing responsibilities under the contract are described as “... *the effective operation of the ticketing system and therefore encompassing provision of marketing activities related to the ticket itself, the range of tickets available from different outlets, the use of ticket vending and validation machines and the agency network*”.

8.33 The contract requires OneLink to develop and implement a comprehensive marketing plan and demonstrate to the PTC that it continually understands the specific marketing challenges involved in introducing the automated system into Melbourne's complex and integrated public transport system.

8.34 Although incorporating only broad marketing objectives, the marketing plan presented by OneLink in its tender submission was utilised for its initial marketing after the signing of the contract in 1994. The intention of this plan was to provide a framework for future marketing and education activities and outline the activities to be undertaken prior to the initial phase 1 commissioning of the project. Audit considered this initial plan to be of limited usefulness because of its very broad nature and the fact that it did not include any specific performance indicators against which OneLink's marketing activities could be monitored. Nevertheless, because of the delays associated with the project, the impact of the plan's limitations would have been of a lesser magnitude than if implementation of the project had proceeded in accordance with targets.

8.35 It was not until 1997, or 3 years after the signing of the contract, that the PTC obtained a comprehensive plan from OneLink which included specific marketing objectives and strategies. The principal objective of this plan was to outline the education and marketing activities to be undertaken during the process of extending the automated system across the entire public transport network following phase 1 commissioning in November 1997. The revised plan incorporated detailed performance measures against which the implementation of the plan could be monitored.

8.36 The contract provided that expenditure associated with public education and marketing activities would be reimbursed by the PTC to OneLink on the basis of an agreed budget. Any changes to this budget or to specific marketing activities required mutual acceptance by the 2 parties. Currently, the agreed budget for education and marketing is around \$6.5 million which represents approximately 2 per cent of the total contractual cost for the automated system. Based on specialist advice provided to audit, this level of marketing expenditure is considered low given that there was the significant requirement to achieve public acceptance of the shift from manual to automated ticketing arrangements.



8.37 Over the last 12 months, market research has been undertaken by both the PTC and OneLink to assess the extent to which objectives outlined in the plan were progressively achieved during the period after phase 1 commissioning. The most recent market research, which was commissioned in April 1998, revealed that generally the objectives established under the 1997 marketing plan had not, at that time, been achieved. Table 8A outlines the results of this research.

**TABLE 8A
EXTENT OF ACHIEVEMENT OF MARKETING OBJECTIVES,
APRIL 1998**

<i>Objective included in 1997 marketing plan</i>	<i>Results of market research, April 1998</i>
<ul style="list-style-type: none"> ● 70 per cent consumer acceptance within defined geographical areas, as the automated system is implemented across the Melbourne Metropolitan area ● 65 per cent of consumers encouraged to pre-purchase tickets prior to boarding trams and buses by the end of Phase 2 (final commissioning) ● 65 per cent of users accept that the transition from the old to the automated system has been good to excellent ● 85 per cent of consumers have the required level of information to assist in their understanding of the system during roll-out of the system 	<ul style="list-style-type: none"> ● Overall consumer acceptance not measured in April 1998 research ● Only 14 per cent of users were pre-purchasing tickets ● Around half of users rated the transition from the old to new system as fair to poor ● 74 per cent of users considered information provided was fair to excellent

Source: The 1997 marketing plan and April 1998 research reports.

8.38 The results of the April 1998 research needed to be considered in light of the fact that roll-out of the automated system across the public transport network was still in progress. However, the information certainly provided an early indication to both the PTC and OneLink of the need to reassess marketing and education strategies if acceptance of the system was to be ultimately achieved. Also, the PTC considered that the ability to meet the marketing objectives would no doubt have been affected during this time by the extensive negative media coverage on the performance of the system.

8.39 Considerable efforts have been made by OneLink and the PTC during the roll-out phase to address emerging issues and improve the quality and relevance of information provided to the public on the use of the automated system. In the main, these improvements have involved the provision of additional brochures and signage to further explain aspects of the system. Notwithstanding these efforts, certain of this additional information was at the initiative of the PTC which considered that OneLink’s prior public education activities had not been fully effective.



Additional brochures prepared by the PTC to further educate the travelling public about the new automated system.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

It is misleading to calculate the expenditure on marketing to date as a proportion of the total contract cost for the system over the full nine year term of the contract. The marketing expenditure to date is approximately 28% of total payments made.

Results of audit surveys on education and marketing campaigns conducted by OneLink and the PTC

8.40 A major aspect of the 2 market surveys conducted by audit during May and August 1998 was an assessment of the effectiveness of public education and marketing in terms of:

- users’ knowledge and awareness of information circulated during the introduction of the automated system; and
- the impact this information had on the ability of public transport customers to use the system.



8.41 The conduct of 2 surveys also enabled analysis of change in knowledge or awareness as the automated system became more widely available for use on public transport.

Reaction to information issued about the automated system

8.42 In the surveys, respondents were asked whether they had seen or heard of any information about the new automated system before it was introduced in their area. Given the progressive roll-out of the system, for some respondents, the question could have related to information received some months prior to the surveys. Those respondents who were aware of some information were further asked whether they were satisfied with the information that had been provided. The following table summarises responses to these questions received in the 2 surveys.

Did you see or hear any information about how to use the new ticketing system on public transport before it began to operate in your area?
Are you satisfied with the information on the new ticketing system that was supplied to you before it started operation?

	<i>August 1998</i>	<i>May 1998</i>
	(%)	(%)
Saw or heard of information about the fare system before it began operating in the area?		
Yes	52	42
No	44	55
Don't know or Can't remember	4	3
Of the "yes" responses: Satisfied with information supplied before system commenced operation?		
Yes	75	73
No	17	16
Don't know or Can't remember	8	11

8.43 Overall, there has been an increase from 42 per cent to 52 per cent in the level of awareness of promotional information provided to users on the new fare system in the period between the 2 surveys. This increase is likely to have occurred as a result of more users having been exposed to public education activities as the system was progressively rolled-out across the transport network. However, the relatively high level of users remaining unaware or unsatisfied with information available on the system raises some concern over the effectiveness of material distributed through the public education campaigns undertaken. These results should also be considered in the context of the PTC anticipating that at least 85 per cent of users should have the required level of information to assist in their understanding of the system during roll-out of the system.

8.44 For those users aware of advance information provided on the fare system, there was a relatively high level of satisfaction, of in excess of 70 per cent, with the quality of this information.

8.45 In terms of the sources of information available to the respondents, it is clear from the surveys that there were different levels of awareness of the various forms of information distributed on the fare system.

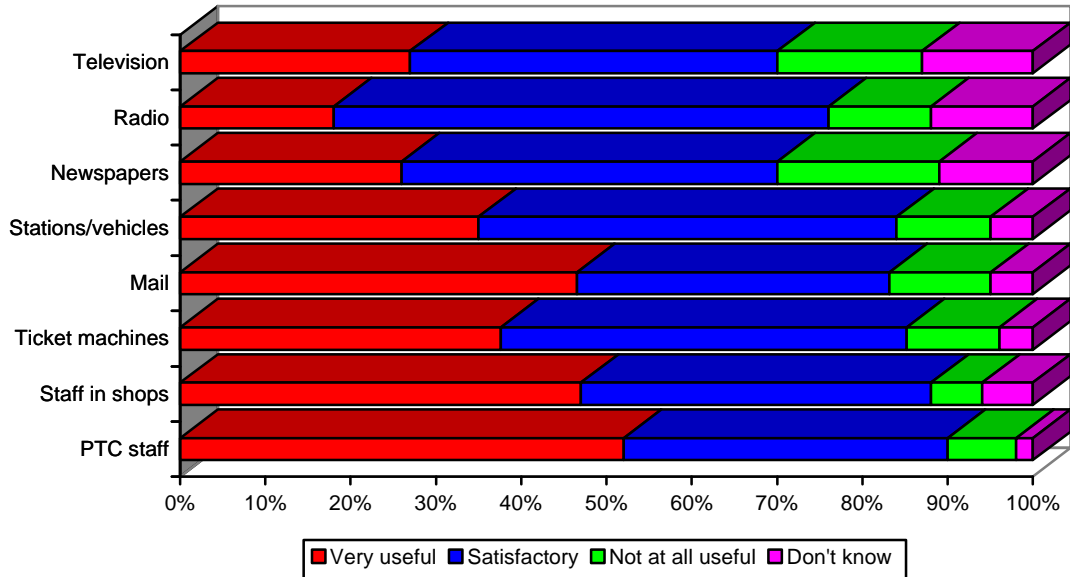
Have you, to date, heard or seen any announcements, explanations or other information on the new public transport ticketing system from the following sources?

<i>Source of information</i>	<i>August 1998</i>	<i>May 1998</i>
	(%)	(%)
Instructions near or on ticket vending machines	38	47
Advice from staff at train stations or on trams or buses	25	35
Leaflets or brochures at stations or on vehicles	22	28
Ads or announcements in newspapers	16	25
Leaflets or brochures in the mail	12	17
Ads or announcements on television	9	17
Ads or announcements on radio	6	8
Advice from people in shops or other outlets	6	6
None or Don't know	38	23

8.46 The responses provided in the above table indicate that a wide range of sources of public education material have been utilised by public transport users. Reductions in the perceived level of awareness of all sources of information by August 1998 and, in particular, instructions accompanying ticket machines, may well reflect the greater awareness that users now have of the automated system without the need to refer to promotional material.

8.47 The usefulness of the varying sources of information was covered in the surveys. For those claiming to have seen a particular source of information, the most useful information was considered to be those involving direct contact with PTC personnel or retail agency staff, as well as information provided by mail.

**How useful did you find the information from the following sources?
Would you say it was very useful, satisfactory or not at all useful?**



8.48 Those who were aware of a source of information after prompting were then probed as to how useful they had found the information.

Could you please tell me how useful, overall, was the information that you received - through all sources - on the automated ticketing system? Was it ...

	Total August 1998	14-24 years	25-44 years	45-64 years	65+ years	Total May 1998
Proportion of respondents aware of information after prompting during the survey	62%	60%	63%	65%	57%	81%
Very useful	26%	33%	25%	25%	24%	22%
Fairly useful	51%	53%	50%	53%	47%	47%
Not very useful	12%	9%	15%	13%	8%	14%
Not at all useful	6%	3%	7%	6%	11%	7%
Don't know	4%	2%	4%	4%	10%	9%

Note: Figures have been rounded to the nearest percentage.

8.49 The August 1998 survey reflected a slight improvement in terms of the proportion claiming that the introductory information was fairly or very useful, a situation which indicated that the information provided on the automated system was informative and well presented to over 77 per cent of transport users in August 1998.

8.50 Regardless of whether they had encountered any previous information, respondents were asked whether there were any areas or issues where they believed the method of informing the public on the automated system as distinct from the information itself could be improved. In response, some 46 per cent in the August 1998 survey replied that improvements could be made (compared with 42 per cent in the May study).

Are there any areas or issues where you believe the method of informing the public could be improved?
On what areas or issues do you think the method of informing the public could be improved?

	<i>Total August 1998</i>	<i>Total May 1998</i>
<i>Sample</i>	1 067	1 400
Yes, could be improved	46%	42%
Suggested improvements -		
Advertise how to use ticket system step-by-step on TV, radio, newspapers	27%	41%
All instructions for use should be clearly set out on one board near machines	19%	15%
Brochures sent to each household	15%	16%
More widespread information reaching more people/more intensive	15%	6%
Have staff on hand to assist during the first few months	11%	20%
Resource all stations/someone to answer questions	11%	6%
Return conductors to transport/ inspectors	10%	8%
Large timetable/instruction boards/prominently displayed and placed	5%	7%
Information made available in several languages	4%	5%
Advice from people at point of sale/shops/outlets	2%	4%

8.51 The most often cited improvement suggested by respondents was step-by-step instructions on radio and television. Given the period of time in which the system has been available for use by the public, concentration on such an approach may no longer be feasible or warranted as indicated by the far lower percentage of respondents suggesting this improvement in the August 1998 survey. However, the responses indicate that information on any future changes to the ticketing system, such as new ticket types, may be best provided through these forms of media.

Impact of information on the ability of public transport customers to use the automated system

8.52 In order to assess the effectiveness of the information campaign, respondents to the surveys were asked to describe their present knowledge of how the public transport ticket vending and validating machines work.



How would you describe your present knowledge of how the public transport ticket vending and validating machines work? Would you say ...

	<i>Total August 1998</i>	<i>14-24 years</i>	<i>25-44 years</i>	<i>45-64 years</i>	<i>65+ years</i>	<i>Total May 1998</i>
<i>Sample</i>	1 067	269	372	255	169	1 400
Have no problems using them	59%	86%	52%	56%	48%	54%
A bit unsure of how to use them	22%	11%	26%	26%	21%	21%
Don't know how to use them	16%	3%	19%	15%	27%	20%
Don't know	3%	1%	3%	4%	5%	5%

Note: Figures have been rounded to nearest percentage.

8.53 By August 1998, the majority of public transport users considered that they had no problems in using ticket and validation machines. This represented a marginal increase from May 1998 and is most likely due to the increasing experience of commuters with the new ticketing system. Additional information obtained during the surveys identified that frequent users of public transport were far less likely to have problems in using fare collection equipment than those using public transport less frequently.

8.54 The fact that, by August 1998, following completion of system installation, around 38 per cent of respondents continued to express uncertainty or a lack of knowledge of how to use ticket and vending machines remains of concern. A particular need exists for the PTC to address the uncertainty expressed by older users of the system especially those aged over 65 years where 27 per cent advised that they did not know how to use key fare collection equipment. This is particularly relevant given that the over 65 age group using concession cards represent in excess of 16 per cent of all transport commuters and has been recognised by the PTC as a growth area for patronage.

8.55 While large-scale public information campaigns on use of the automated system may no longer be necessary, the PTC should consider action directly targeted at improving the knowledge of certain groups of public transport users, particularly the more elderly users. Consultation with relevant community organisations representing these groups may assist in identifying the types of information which would best suit the needs of these users. Action should also be taken to ensure that available information, such as user instructions on ticket machines, is sufficiently clear and simple to make less frequent commuters aware of the operation of ticketing and validation equipment.

PUBLIC SATISFACTION WITH NEW TICKETING ARRANGEMENTS

8.56 Throughout the implementation of the automated system, extensive media coverage has been given to problems experienced by users of the system. It is inevitable that a certain level of difficulties will be experienced during such a major change to ticketing arrangements, especially due to the delays in implementing the system.

8.57 The 2 surveys conducted during the audit included a number of questions relating to satisfaction with the new ticketing arrangements. These questions were aimed at identifying the extent of problems as perceived by the public and whether these perceptions had changed in the time between the surveys.

8.58 Respondents were specifically questioned on whether they had encountered any of the following conditions in the 2 months preceding August 1998.

Have you found any of the following things in your use of the public transport system in recent months. Could you please tell me whether you always, frequently, sometimes or never have encountered these situations?

Sample = 1 067	Always	Frequently	Sometimes	Never	Don't know
	s				
	(%)	(%)	(%)	(%)	(%)
System seems easier to use	18	12	20	31	19
System seems to be quicker	12	11	24	32	22
Long queues to purchase ticket	8	15	22	37	18
Long queues to validate ticket	5	11	20	46	18
Machines are broken down	2	11	33	38	17
Validating machines don't work	2	7	28	43	20
Issue incorrect tickets or change	2	3	11	60	24
Machines are vandalised	1	4	19	55	21

8.59 A sizeable proportion of users consider that the system is easier to use and also quicker than the previous manual fare system. However, there remains a slightly greater proportion of people who think the new automated system is never easy to use and slower than the previous fare system which relied extensively on manual ticket sales.

8.60 The level of users who reported that machines were either always, frequently or sometimes broken down (46 per cent) or that validating machines were not working (37 per cent) is a major concern for the PTC. The PTC should conduct further investigations of these views as equipment failure is likely to result in users not purchasing and validating tickets. Such occurrences can significantly impact on PTC fare revenue.

8.61 Given concerns expressed in the media, an additional question was included in the August 1998 survey specifically in relation to travellers physically maintaining their balance when purchasing or validating tickets while trams are mobile. This problem was largely irrelevant in the past when travellers purchased tickets from conductors.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The proportion of users reporting equipment unavailable has been of concern to the PTC. However with increasing levels of availability this issue is being resolved. Nonetheless the PTC will be conducting future investigations to determine customer perceptions in relation to the ongoing educational marketing activities.

Some people have said that they have had problems in keeping their balance when buying a ticket on a tram and it starts to move. Could you please tell me to what extent do you find this a problem?

	Total	14-24 yrs	25-44 yrs	45-64 yrs	65+ yrs
Percentage of respondents who travelled on a tram in the last week -	382	97	142	88	54
No problem	45%	64%	37%	40%	46%
Minor problem	31%	27%	38%	30%	19%
Major problem	15%	2%	20%	18%	21%
Don't know	8%	6%	6%	12%	13%

8.62 It appears that keeping one’s physical balance whilst using the machines on trams is not seen as a problem by those aged under 25 but is viewed as a major problem for older age travellers. While some action (for example, the installation of handrails on the ticket vending machines) has already been taken by OneLink to improve facilities to prevent overbalancing when using ticket machines, it is clear from the results outlined above that further steps are necessary to minimise the risk of injury to passengers.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The tram business operators have been conducting Driver Awareness Refresher training to mitigate this problem. The encouragement of pre-purchasing at retail outlets is also directed to minimising ticket sales from on-board machines.

8.63 Respondents were also asked to rate aspects of reliability and ease of use of the new ticketing system.

I'd now like you to rate a number of particular aspects of the new ticketing system. As I read out each one, could you please tell me whether in your experience you have found it to be very poor, poor, fair, good, very good or excellent?

Sample = 774	Excellent	Very good	Good	Fair	Poor	Very poor	Don't know
	(%)	(%)	(%)	(%)	(%)	(%)	(%)
Reliability of ticket vending and validating machines	5	16	33	23	16	3	3
Ease of using machines to buy tickets	8	19	32	21	11	5	3
Ease of using machines to validate tickets	8	19	38	19	7	3	5
Ease of switching from the old to the new ticketing system	5	15	28	25	16	8	4
Overall rating of automated ticketing system	5	17	27	24	14	11	2

8.64 The above views were based only on respondents' use of the fare system in the 2 months preceding the August 1998 survey. The results were not materially different from those obtained in May 1998. Overall, just over one in five travellers rated the fare system as very good or excellent whilst one in four rated it as poor or very poor.

8.65 Finally, respondents to the surveys were asked to select a statement, based on their experience, which best describes their assessment of the current status of the new ticketing system. As such, the responses in this area provided an indication of the overall satisfaction of users with the system.

Based on your experience, which of the following statements best describes the current status of the new ticketing system?

	Total August 1998	Total May 1998
Sample	1 067	1 400
Works extremely well	6%	5%
Provides a good reliable service	13%	9%
Operates adequately	25%	21%
Is in some need of improvement	31%	27%
Is in need of a lot of improvement	19%	23%
Don't know	8%	14%

8.66 While there is an increasing level of public satisfaction with the automated system, there still remains a very high proportion of patrons (50 per cent) who consider the system still requires either some or substantial improvement. To address this perception, the PTC will need to take action on this issue in view of the Government's commitment to further increase public transport patronage.



Selection of newspaper headlines outlining community concerns over the new automated system.

❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The relatively high proportion of patrons who considered the system required some or substantial improvement at the time of surveys would no doubt have been influenced by a number of factors including the lower levels of equipment availability during the system rollout, the removal of conductors from trams and the significant negative media coverage of the changes brought about by the introduction of the Automatic Ticketing System at the time. As stated previously the improving reliability and availability of the equipment together with increasing passenger familiarisation and further marketing initiatives should see a significant improvement in these perceptions.

PERCEIVED IMPACT ON THE QUALITY OF PUBLIC TRANSPORT

8.67 During the surveys, a number of questions were directed at users' perceived impact of the introduction of the new fare collection arrangements on the quality of service provided by public transport, and whether any assessed impact on quality would influence decisions by commuters to use public transport in future.

8.68 Overall, a majority of users perceived that the introduction of the automated system had resulted in a lowering of the quality of public transport. However, it was interesting to find that views had substantially changed over the period between the 2 surveys with 27 per cent in August 1998 considering that the quality of service had improved compared with only 18 per cent in May 1998.

Do you believe that the introduction of the new automated ticketing system has resulted in a better or worse quality of service to the public transport user?

	<i>Total August 1998</i>	<i>14-24 yrs</i>	<i>25-44 yrs</i>	<i>45-64 yrs</i>	<i>65+ yrs</i>	<i>Total May 1998</i>
<i>Sample</i>	1 067	269	372	255	169	1 400
Better	27%	50%	19%	22%	21%	18%
Same	17%	14%	18%	19%	18%	14%
Worse	48%	33%	53%	50%	49%	54%
Don't know	9%	2%	10%	9%	12%	13%

8.69 Views on the impact on service quality varied significantly between age groups. In August 1998, half of those aged 14-24 years believed that the automated fare system had resulted in better quality service. On the other hand, about half of those aged over 25 years were of the opinion that the quality of service had worsened. A higher proportion of regular transport users also had a more positive opinion of the system than less frequent users while tram users had a less positive view than users of other modes of public transport.

8.70 Given the large proportion of users retaining the view that the system has led to reduced quality in public transport and the large variations in views between different groups of public transport users, the PTC and OneLink need to implement further promotional and public education activities aimed at gaining higher levels of acceptance of the fare system.

8.71 To obtain a better understanding of respondents' views of public transport quality generally, opinions were sought on user satisfaction with certain broad aspects of public transport.



In the last 2 months, to what extent have you been satisfied with the following aspects of the public transport system generally? As I read out each aspect, could you tell me please whether you are very dissatisfied, quite dissatisfied, quite satisfied or very satisfied?

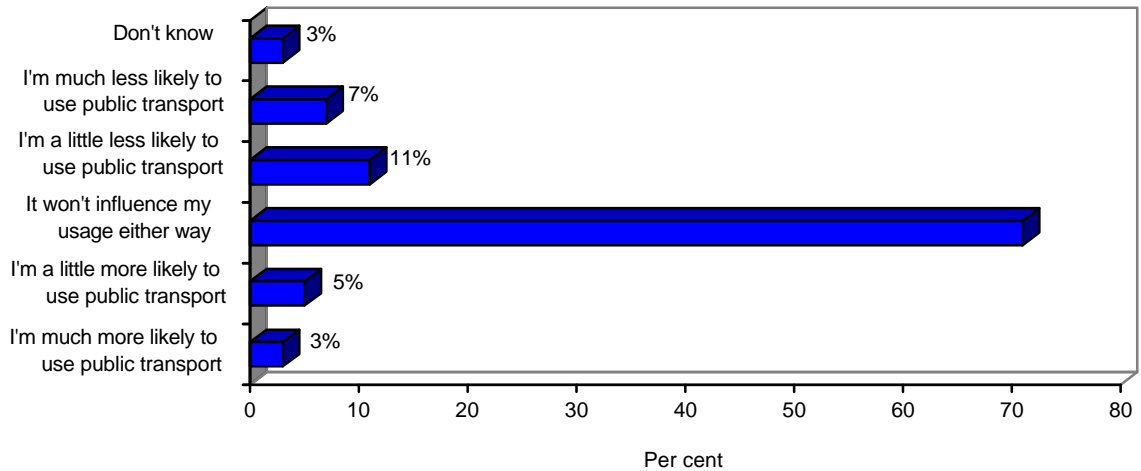
Sample = 1 067	Very satisfied	Quite satisfied	Quite dissatisfied	Very dissatisfied	Don't know
	(%)	(%)	(%)	(%)	(%)
Provision of travel information	8	56	16	6	15
Safety and security at railway stations and on trams and buses	7	38	23	19	14
Services running to schedule	11	50	17	9	13
Provision of physical assistance to transport users, when required	6	29	17	20	28
Allocation of sufficient buses, trams or trains	9	56	13	8	14

8.72 Analysis of the reasons for dissatisfaction with the public transport system revealed safety and security as the primary concern of public transport users, followed by the provision of physical assistance to travellers.

8.73 Concerns over safety, security and physical assistance are of particular relevance given the removal of tram conductors and significant reductions in rail staff following the introduction of the automated fare collection system. While it is recognised that the PTC currently devotes substantial resources to safety and security issues, the user perceptions outlined above indicate that further consideration needs to be directed to additional methods of addressing the concerns of public transport commuters.

8.74 Despite the level of dissatisfaction and particular concerns expressed following the introduction of the automated system, a large majority of users surveyed did not consider that the new system would influence their future intentions to use public transport in the future.

Which of the following statements best describes the new ticketing system's influence, if any, on your future usage of public transport?



8.75 Nevertheless, 18 per cent of users considered that they were a little or much less likely to use public transport since the introduction of the automated system. The implications to the PTC's fare revenue base would be serious should this group of users seek alternatives to public transport at some stage in the future. Whether this scenario would eventuate is uncertain, however, it does reinforce the importance of the PTC ensuring that the system is working with maximum effectiveness from the viewpoint of the public as soon as possible and promoting the benefits of the system.

REQUIREMENTS OF PUBLIC TRANSPORT USERS WITH SPECIAL NEEDS

8.76 A significant result from the market surveys conducted by audit was that over one in 3 public transport users held a concession card with a very high rate of concession holders among those aged 65 and over. Accordingly, it would have been important that any particular needs of these groups were considered in the design and implementation of the automated system.

8.77 As referred to in Part 4 of this Report, while recognition was given to the importance of consulting with special needs groups, such as the aged or the disabled, in the initial planning stages of the project, the fast-tracking of the automated system effectively precluded the PTC from embarking on this initial consultative process.

8.78 It was not until after the appointment of OneLink in 1994 during the design and development phase of the project that specific attention was given to identifying the needs and views of special user groups. The contract allocated total responsibility to OneLink for undertaking the important community consultative role, with the PTC monitoring progress on a continuing basis. As a result of the consultation undertaken by OneLink, many elements of the ultimate design of ticket and validation machines were derived from the views expressed by community groups.



8.79 It is unrealistic to expect that system equipment could be designed to totally meet the requirements of all end users, including those needing special consideration. With this in mind, the PTC envisaged that the availability of a range of alternative methods of ticket purchasing such as “off-the-system” purchases and the introduction of touch cards (which would obviate the need for aged or disabled travellers to purchase tickets from machines and validate them through the insertion of a card) would meet many of the needs of special user groups.

8.80 Notwithstanding these efforts, discussions and focus group interviews held by audit in June 1998 with various user organisations identified a range of concerns with the automated system, including:

- The continuing unavailability of touchcards (originally scheduled for progressive implementation from February 1995 but yet to be introduced within the system). The PTC advised audit that the delay was due to ongoing testing and the need to resolve problems with this technology;
- A perceived lack of security and assistance for the elderly and legally blind persons when using ticket machines, barriers and other features of the system;
- Problems experienced with design issues such as vending machine buttons and coin slots located too high and out of reach, equipment displays hard to read during daylight hours and the small printing on tickets;
- A continuing lack of awareness of alternative ticket purchasing facilities such as phone order and home delivery service and the locations of retail agencies in the metropolitan area; and
- Perceived security fears where credit card details were required to be disclosed to use the home delivery service.



Representatives of special needs groups at a focus group session held by audit.

8.81 To address issues similar to those identified by audit, the Minister for Transport established a working party to examine the concerns of special needs groups. The report of this working party was provided to the Minister in June 1998. Some of the specific recommendations of the working party were:

- the implementation of an improved community education program, including the use of ethnic radio and videos with clear, easy to understand information on how to use the automated system;
- improved driver training and awareness programs for tram drivers in order to increase the level of assistance available to users;
- wheelchair access be a requirement for selection of new retail agents;
- payment options for delivery of tickets be investigated;
- staff at major stations receive disability awareness training; and
- customer service officers provide assistance for the elderly and people with disabilities in purchasing and validating tickets.

8.82 Audit was informed by the PTC that these recommendations are still under consideration by the Minister.



8.83 The recommendations provided by the ministerial working party address many of the issues currently faced by special needs groups utilising public transport. In conjunction with the long-delayed introduction of touchcard technology, early implementation of these recommendations would satisfy many of the concerns of the user groups and could lead to increased patronage of public transport.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

The PTC and business operators are currently implementing and/or assessing further measures to address many of the issues raised.

IMPACT ON NON-METROPOLITAN USERS OF THE AUTOMATED SYSTEM

View of tourism authorities

8.84 Discussions were held by audit with a number of authorities involved in the promotion of tourism and provision of assistance to visitors to the Melbourne metropolitan area.

8.85 Generally, these organisations had not received a significant number of complaints from tourists regarding the new automated system and had few concerns over the implementation of the system on trains and buses. However, a number of concerns were expressed in relation to the operation of the system on trams, particularly given the status of Melbourne's tram system as a tourist attraction and that it is the main mode of transport used by tourists to Melbourne. These concerns included:

- the lack of availability of daily tickets on trams, particularly as tourists are encouraged to use this type of ticket;
- the inconvenience of tram ticket vending machines not accepting notes; and
- the loss of the public relations role formerly performed by tram conductors.

8.86 The tourism authorities also expressed the view that installation of ticket machines at the Port of Melbourne would facilitate the purchase of tickets as this is often the first point of entry for significant numbers of visitors to Melbourne prior to their use of trams to travel to the metropolitan area.

8.87 Agencies were disappointed with the lack of consultation by the PTC prior to the implementation of the automated system. As a result, printed information provided to tourists by the agencies, which incorporated public transport information, had not been updated to take account of the features of the system. At the time of discussions with audit, agencies were in the process of updating information and they considered that this exercise would have been expedited through earlier consultation with the PTC.

8.88 In view of the large number of tourists visiting Melbourne, it is critical that tourism authorities are informed well in advance of any future changes to the automated system or other aspects of public transport so that accurate information is disseminated to visitors using the public transport system.

Views of respondents expressed in the market surveys

8.89 Around a third of non-metropolitan respondents to the survey advised that they had seen or heard information about how to use the automated system on Melbourne's public transport. By far the major source of this information was through instructions placed on or beside ticket vending machines. Around 71 per cent of those who claimed to have seen some explanatory information found the information to be very or fairly useful.

8.90 In response to a question on their present level of knowledge of ticket and validation machines, around 63 per cent claimed not to have had any problems, a proportion slightly higher than that expressed by Melbourne residents. To this extent, the system would seem equally user-friendly, with no particular problems posed for out of town visitors. Of those that did express problems, the most common reason given in the surveys involved difficulties experienced in using ticket machines.

8.91 A parallel question asked those who had purchased tickets from an automatic vending machine whether they had subsequently validated the ticket. It appeared that around 7 out of every 8 had done so.

8.92 In responding to questions related to whether certain situations had been encountered, one in 3 claimed to have experienced ticketing machine breakdowns while one in 5 had encountered validating machines that did not work. This compares with the survey of metropolitan users whereby 46 per cent of commuters had experienced ticket machine breakdowns and 37 per cent had encountered validation machines that did not work. The higher proportion of dissatisfied metropolitan users was most likely a reflection of their greater use of the automated system and therefore, of an increased likelihood of encountering problems with machines.

8.93 Overall, with the exception of machine breakdowns, the assessments by non-metropolitan commuters of particular aspects of the new automated system did not vary materially from that of Melbourne residents with:

- less than a quarter considering the system as working extremely well or at least providing a good reliable service;
- a general level of satisfaction with the allocation of sufficient buses, trams or trains, with services running to schedule, the safety and security of the system and with the provision of information on stops or stations to reach different locations in Melbourne; and
- only a small proportion of around 5 per cent being very dissatisfied with public transport.

8.94 It is important that any future marketing or promotional strategies formulated for the new automated system take into account the views of non-metropolitan commuters.

Part 9

**Implications of the
automated system on
future operations of
public transport**

OVERVIEW

9.1 A key objective of the PTC from the introduction of the automated fare collection system was to encourage commuters to pre-purchase tickets from vending machines at rail stations and from a network of retail agencies. In line with this objective, OneLink was required to establish a retail network of at least 750 retail agencies throughout the metropolitan area.

9.2 Audit examination identified that the establishment of the retail network has been slow and only in recent months has the goal of 750 agents been achieved. In addition, market surveys undertaken with specialist assistance by audit indicated low public use of the network as well as a negligible level of usage of the home delivery service for tickets introduced in 1997. The delay in establishing the network has meant that the buying patterns of commuters have become entrenched and the PTC's objective of having at least 90 per cent of tram and bus ticket sales derived from off-vehicle ticket purchases is unlikely to be achieved in the near future.

9.3 An increase in fare revenue from the curbing of fare evasion was a further key outcome envisaged by the PTC from the introduction of the new automated system. However, the system has created a major risk for the PTC in that there is potential for significant lost revenue from fare evasion, particularly in respect to tram travel. While the extent of fare evasion cannot accurately be determined at this stage due to the absence of reliable information within the PTC, the greater risk of fare evasion on the tram system was further borne out by the market research undertaken by audit during August 1998. This research disclosed that 15 per cent of a representative sample of respondents had not purchased a ticket for their last tram journey.

9.4 Based on the PTC's revenue estimates for tram travel during 1997-98 of \$52 million, if 15 per cent of tram commuters regularly failed to purchase tickets, there would be an annual revenue loss broadly equivalent to at least \$8 million, without taking into account other forms of fare evasion. For example, this figure does not include any fare evasion arising from the use of the 2 most popular ticket classes, namely, daily and 2 hour tickets, where any failure by commuters to validate tickets allows them to be used unlawfully for multiple journeys until such time as validation occurs and a time restriction period commences.

9.5 Over the past 6 months with the roll-out of the automated system across the metropolitan public transport network, the PTC has mainly emphasised an educational approach to its customer service and revenue protection activities in preference to fining fare evaders. However, the system has now been completely installed across the metropolitan public transport network and it is likely that most transport users are experienced in its use. Accordingly, the PTC will need to assess the desirability of continuing a sole focus on an educational role at the expense of targeting and penalising intentional fare evaders.



OVERVIEW - continued

9.6 Also, a key priority for the PTC should now be to establish mechanisms, including use of management information generated by the automated system, for accurately determining the magnitude of fare evasion within the new system and to formulate strategies under which fare evasion can be reduced to tolerable levels.

9.7 The results of the surveys undertaken by audit indicated that a sizeable proportion of users (14 per cent) did not validate their tickets which would have a major impact on the completeness and accuracy of management information generated by the automated system. Urgent attention needs to be directed by the PTC to the implementation of strategies specifically aimed at furthering public education of the importance of ticket validation. It should also design deterrents which aim to motivate public transport users to always validate their tickets.

9.8 Several important matters arising from the new automated system and with direct implications for the Government's privatisation plans are currently under consideration by both the PTC and the Department of Treasury and Finance. As an illustration, the system needs to have a capability to facilitate the accurate apportionment of fare revenue between various private operators. Along with final commissioning of the system, these matters must be satisfactorily resolved in order that potential bidders are fully conversant with the ramifications of the system for future business operations within a privatised public transport network.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

PTC believes that the system has not created a major risk for the PTC in that fare evasion existed prior to the introduction of Automatic Ticketing. PTC believes that the combination of effective use of customer service employees, effective education and marketing together with the improved revenue protection available through the use of barriers at railway stations, will result in an improvement to the overall level of fare evasion compared with that prior to the introduction of Automatic Ticketing.

The last sentence of paragraph 9.3 implies that 15 per cent of respondents did not have a ticket for the tram journey. As indicated in paragraph 9.43, the reasons for non-purchase were not sought in the survey and it is quite possible that this 15 per cent in fact represents passengers who had pre purchased tickets or were validly using other travel entitlements.

It is an unwarranted assumption that 15 per cent of passengers who had not purchased a ticket on their last tram journey could be equated to an Annual Revenue loss of \$8 million particularly in light of the comments above. Revenue protection activities were essentially of an educational kind during this period and have subsequently become increasingly revenue enforcement focused.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation - continued

PTC believes that increased revenue enforcement activity combined with market education and community awareness communication campaigns, together with the enhanced revenue protection provided by other aspects of the Automatic Ticketing system, will lead to improvements in the reduction of fare evasion from that existing prior to the introduction of Automatic Ticketing.

The accurate apportionment of fare revenue between respective private operators is not based on the system's capability to apportion fare revenue but is based on a commercial allocation of revenue which is equitable and simple to implement. In view of the multi modal, time and zone based fare structure within the metropolitan public transport system, the Department of Treasury & Finance has developed a revenue allocation algorithm based on passenger usage patterns. Usage is measured in terms of boardings and passenger distance travelled. Currently boarding and passenger distance travelled are estimated using a comprehensive survey technique, however this will progressively move to incorporate data provided through the Automatic Ticketing System once it is fully operational.

NEED FOR RESOLUTION OF MATTERS CONCERNING THE RETAIL AGENCY NETWORK
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OneLink's responsibility for implementing a retail network

9.9 As part of the introduction of the automated system, a major objective of the PTC was to encourage commuters to pre-purchase tickets. The advantages of pre-purchase of tickets were seen as:

- minimising queues at ticket vending machines during peak periods;
- avoidance of difficulties associated with commuters purchasing tickets from vending machines on board trams and buses;
- providing a more convenient service to commuters in enabling advance purchase of tickets and access to a range of information on timetables and travel arrangements; and
- optimising fare revenue cash flows.

9.10 To fulfil the above objective, there was a need to promote the purchase of tickets from vending machines at rail stations and from a network of retail agencies established throughout the metropolitan area. As an incentive for the public to pre-purchase tickets, daily tickets (which permit travel anywhere in the public transport system and are the most common ticket type) are unavailable on trams and can only be purchased from retail agencies and station vending machines.

9.11 Under the contract for the automated system, OneLink was required to establish an operating network of at least 750 individual retail agencies such as newsagents, chemists and milk bars, that are willing to sell public transport tickets. There was no specific timeframe set within the contract for the establishment of the network.



City newsagent selling the “Metcard” public transport ticket.

9.12 Key characteristics of the retail agency network, required under the contract, were as follows:

- a capacity to support a ticketing system which could accommodate a situation whereby less than 10 per cent of tram and bus passengers would eventually purchase tickets on vehicles;
- achievement of a spread of the network throughout the metropolitan area which would enable all commuters to have ready access to a ticket agency;
- retail agents must have in stock at least 90 per cent of the ticket range appropriate to the area in which they are located;
- signage denoting that the retail agent is a seller of tickets must be displayed both inside and outside the agency; and
- agents must stock relevant travel, ticketing and pricing information for commuters.



OneLink's performance in establishing a retail network

9.13 Audit examination of the processes adopted by OneLink in meeting its contractual obligations as outlined above identified that:

- OneLink has been slow in establishing the retail agency network in that as at 31 December 1997 only 30 agencies had been specifically established to sell tickets under the new system. By 31 March 1998, this figure had increased to 292, a situation still well below the minimum contractual target of 750, which prompted the PTC to express concerns to OneLink on the adequacy of progress made by it in this area. By 30 June 1998, there were 450 agencies in place, or 60 per cent of the contractual requirement. In recent months, OneLink has made a concerted effort to increase the number of agencies and by 30 September 1998, the minimum requirement had been achieved with around 760 agencies in place.
- A systems integrity audit conducted by the PTC in March 1998, which involved PTC personnel purchasing tickets at random from 176 retail agents, identified that:
 - only 78 agents (44 per cent) could supply all tickets requested with a further 83 agents able to supply just some of the tickets requested; and
 - the remaining 15 agents had no ticket stock available for sale.

The PTC has not conducted any further system integrity checks of retail agencies but it advised audit that it planned to carry out tests prior to the final commissioning of the automated system; and

- Despite the existence of a PTC MetTicket agency network which was originally established in 1989 to sell MetTickets (scratch tickets), there was no obligation for OneLink to utilise this network.

9.14 Following the concerns expressed by the PTC in March 1998 at the slow progress in establishing the network, OneLink has made greater use of existing retail agencies except in circumstances where the agencies' past performance has been unsatisfactory in relation to meeting their obligations to the PTC. OneLink has also established new retail agencies in locations that it considered would best serve the ticketing requirements of public transport users.

9.15 In audit opinion, OneLink directed its priorities towards roll-out of the system and achieving final commissioning rather than achieving satisfactory progress in generating the establishment of the retail network. Nevertheless, the delay in developing an effective and efficient retail outlet network to serve commuters has meant that the contractual objective of at least 90 per cent of tram and bus ticket sales off-vehicle is unlikely to be achieved in the near future. Realisation of this objective will require a concentrated public awareness campaign to change the ticket buying patterns of commuters who have now become accustomed to purchasing tickets at the point of travel on trams, buses and from station vending machines rather than in advance from the retail network.

.....

Low public use to date of the retail agency network

9.16 To date, the PTC has not obtained from OneLink information on the extent to which commuters have progressively utilised the retail agency network for ticket purchases.

9.17 To ascertain progress in this area, the 2 market surveys undertaken by audit during May and August 1998 (as referred to in Part 8 of this Report) addressed the ticket purchasing patterns of commuters in terms of the level of public awareness of the retail agency network and the extent of actual use of the network.

9.18 By the time of the August 1998 survey, almost two-thirds (63 per cent) of commuters expressed an awareness of a retail source of purchase for their tickets which represented a marginal increase in the level of awareness from the May 1998 survey (57 per cent).

9.19 The survey also showed that some 40 per cent of public transport users over the age of 65 were still unaware of a retail source in their locality.

9.20 Of those respondents who were aware of a retail outlet within their locality, around 60 per cent had not actually purchased a ticket from a retail outlet. The following table outlines the reasons given by these respondents for this lack of use of retail agencies.

Is there any particular reason why you haven't bought a public transport ticket from that retail outlet?

	<i>August 1998 survey</i>	<i>May 1998 survey</i>
	(%)	(%)
More convenient to buy ticket from tram/train/bus	54	63
Very low requirement for ticket purchase	13	10
Outlet not conveniently located near transport	10	13
Buy at station	6	-
Don't remember to pre-purchase before using public transport	4	4
Buy yearly	2	2
Have a rail pass	2	1
Don't know	4	5

9.21 It can be seen that the convenience of buying tickets from trams, trains or buses was the dominant explanation given by almost two-thirds (63 per cent) of respondents in May 1998 and by just over half in August 1998. In other words, a high level of commuters had not changed their ticket purchasing behaviour since the advent of the new automated system, a situation which should be of some concern to the PTC if the objective of having 90 per cent of ticket sales derived from retail agents and station ticket machines is to be achieved.

9.22 It is also significant that, although there was a small decrease in the number of commuters who cited the lack of a convenient outlet as the reason for their non-use of a retail agent, there still remains a significant problem given the large increase in the number of retail outlets since June 1998. In part, this may be attributable to the failure of OneLink to effectively promote the establishment of the new outlets.

9.23 With the automated system now operational across the public transport network and the expansion of the number of retail agencies over the last few months, the PTC should ensure that OneLink re-evaluates its current marketing strategies in relation to retail outlets. Particular attention should be directed towards specific strategies to increase public awareness of retail outlets and the advantages of advance purchasing of tickets.

□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC has sought to obtain information from OneLink in relation to utilisation of the retail agency network. Reports to enable this assessment to be undertaken by PTC are yet to be delivered by OneLink.

Preferred place of ticket purchase

9.24 The audit survey also requested information on the usual place of ticket purchase by public transport users. The following table summarises the answers provided by respondents.

Were do you mostly buy your tickets for public transport?

<i>Place of purchase</i>	<i>August 1998 survey</i>	<i>May 1998 survey</i>
	(%)	(%)
Ticket vending machine at rail station	31	26
Shop or other retail outlet	21	16
Ticket machine on a tram or bus	19	19
Bought from station booking offices located at main or other staffed stations	13	18
Bought from a conductor or station staff	11	15
Bus driver	3	4
From work	1	1
Bought from home delivery service of the PTC	-	(a)
Other	(a)	(a)
Don't know	1	(a)

(a) Percentage of respondents less than one per cent.



9.25 As identified in the August 1998 survey, the major sources of ticket purchases were ticket vending machines located at rail stations (31 per cent) and the retail outlets (21 per cent). The combined position of 52 per cent derived from the survey was therefore well below the contractual objective of having at least 90 per cent of commuters purchasing tickets from retail outlets and rail station vending machines.

9.26 Audit considers that the PTC as contract manager should be monitoring closely the progress of OneLink in changing the ticket purchasing patterns of commuters. In this regard, OneLink should be required to provide periodic performance information to the PTC on ticket sales patterns both within and outside the retail network in order that adverse trends can be quickly identified and acted upon. Apart from helping to identify the focus of ongoing promotional strategies, the analysis of such information would also assist the PTC in forming a view on whether the “90 per cent” goal for off-vehicle purchases was realistic and achievable.

Need for greater promotion of ticket home delivery service

9.27 In February 1997, the PTC introduced a service under which tickets could be home delivered to the public for orders in excess of \$10 in value. The objective of this home delivery service was to promote off-system purchase of tickets for those regular public transport users who may not have convenient access to retail outlets or other ticket purchasing options. It was envisaged that such a service could be particularly convenient for special needs groups within the community including the disabled and the elderly.

9.28 The market surveys undertaken by audit sought to ascertain the level of public awareness and usage of this service. Relevant details are provided below.

Do you know that the public transport corporation offers a service that delivers tickets to your home for ticket orders over \$10?
Have you ever bought a ticket for public transport using this home delivery service?

	<i>August 1998 survey</i>	<i>May 1998 survey</i>
	(%)	(%)
From all respondents -		
No , not aware of home delivery service	64	80
Yes , aware of home delivery service	36	20
From respondents aware of the service -		
Have utilised service	1	3



9.29 As indicated in the table, the majority of respondents were not aware of the home delivery service and use of the service by those who had knowledge of the facility was exceptionally low.

9.30 The PTC should ensure that action is taken by OneLink to promote the availability of the home delivery ticketing service to determine the extent of public demand and, in turn, whether retention of the service is cost-effective.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

Reference to the telephone ordering system have been incorporated into communications material to date. However this will receive particular focus in relation to passengers with special needs. PTC will monitor the use of this system.

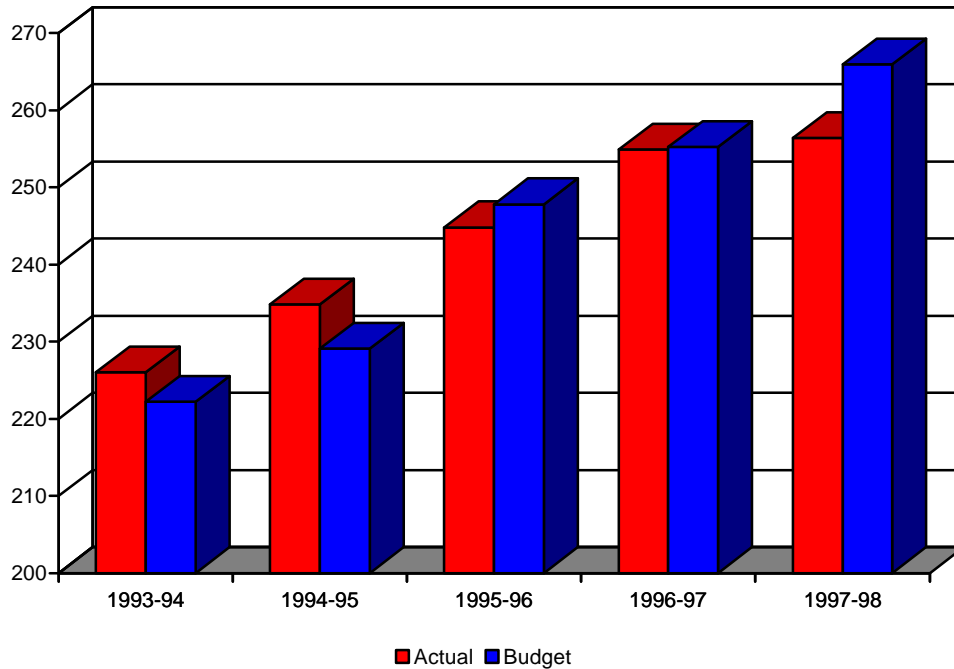
POTENTIAL IMPACT OF THE AUTOMATED SYSTEM ON REVENUE AND FARE EVASION

Revenue levels since introduction of the automated system

9.31 Commentary in Part 6 of this Report identified that phase 1 commissioning of the automated fare collection system, representing approximating 10 per cent of the public transport system, occurred in November 1997. While final commissioning is yet to eventuate, operation of the new automated system has progressively extended across the total metropolitan area since that time.

9.32 An analysis of PTC revenue trends over recent years and up to and including 1997-98 is outlined in Chart 9A. This analysis provides a preliminary indication of the impact of the new fare collection processes on fare revenue in comparison with budget estimates.

CHART 9A
PTC METROPOLITAN FARE REVENUE AND BUDGET ESTIMATES,
JULY 1993 TO JUNE 1998
(\$million)



Source: Financial records of the PTC.

9.33 As illustrated in Chart 9A, metropolitan fare revenue of the PTC steadily increased over the 4 financial years immediately preceding 1997-98, the year which coincided with the full introduction of the automated system. The PTC attributed these past increases in annual fare revenue to fare rises and expanding patronage levels as estimated from periodic passenger surveys.

9.34 In 1997-98, around \$256 million, compared with a budget projection of \$266 million, was generated as fare revenue from the PTC's metropolitan public transport operations.

9.35 Revenue for 1997-98 increased only by 0.6 per cent when compared with the budget projection of around 4 per cent despite the fact that 1997-98 was the first full year affected by a fare increase of 3.4 per cent, introduced on 1 January 1997. On the assumption that patronage levels and accordingly revenue collections would continue to increase in line with budget projections, the budget shortfall of around \$10 million (or 3.8 per cent) could, at least in part, be attributed to fare evasion.

9.36 It is not possible to specifically link the failure by the PTC in 1997-98 to achieve fare revenue budget estimates to the introduction of the automated system as the first data covering a full financial year will not be available until 1998-99. In addition, the absence of accurate and reliable management information generated from the system inhibits opportunities to identify potential fare evasion which can occur in part from commuters not validating their tickets, especially while travelling on trams.



9.37 However, what is clear is that the virtual stagnation of fare revenue levels in 1997-98 indicates there is an urgent need for the PTC to establish the underlying reasons for this occurrence, including whether the introduction of the system has been a significant contributing factor.

□ *RESPONSE provided by Chief Executive, Public Transport Corporation*

Budget shortfall is under review by the PTC.

Potential implications of the automated system on the level of fare evasion

9.38 In the Auditor-General’s May 1998 Special Report No. 57 entitled *Public Transport Reforms: Moving from a system to a service*, mention was made of the importance of the PTC developing a strategy to control and accurately monitor fare evasion within the automated ticketing environment. Such action was viewed as vital if the financial benefits (in the form of a lower annual taxpayers’ subsidy) generated by the Government under its public transport reform program were to be sustained.

9.39 A key outcome envisaged by the PTC from the introduction of the automated system was an increase in total revenue through the curbing of fare evasion. Particular emphasis was placed on this outcome given the PTC’s view that fare evasion had grown under the State’s previous Met Ticket system to levels estimated at between \$10 and \$30 million per year. The PTC estimated that annual lost revenue from fare evasions would be reduced by up to \$11 million following full implementation of the new system.

9.40 The extent to which the automated system impacts on fare evasion, in terms of both controls and risks, is detailed below:

- In regard to train travel, strong control is exercised at the 21 major metropolitan rail stations as passengers can only enter or depart rail platforms by activating barriers through the insertion of valid tickets. The PTC has estimated that on a daily basis 70 per cent of all train travellers will pass through a barrier at least once;
- There is less control over rail travel between smaller stations at which access barriers have not been installed and reliance is placed on passengers to voluntarily validate tickets;
- The emergence of a major risk in that the previous high level of ticket checking on trams through the deployment of conductors has been significantly weakened. Tickets purchased on trams are automatically validated. However, where tickets are purchased from other sources, reliance is now placed on passengers to validate these tickets when commencing a journey on trams. The system also relies on commuters to actually purchase a ticket. In the absence of an ongoing presence of conductors or customer service officers on trams, there is minimal likelihood that travellers who do not purchase or validate their tickets would be detected;



- A risk exists that passengers without a valid concession entitlement may purchase and use concession tickets acquired through ticket machines; and
- On buses, tickets purchased from drivers will be automatically validated. However, reliance is placed on passengers to validate pre-purchased tickets, although the presence of a bus driver may provide a deterrent against evasion.

9.41 In effect, the new automated system has given rise to a mixture of controls and risks in relation to the important question of fare evasion. By far, however, the major risk confronting the PTC involves the potential for significant lost revenue from fare evasion in respect to tram travel, a view confirmed to audit by operational staff at the PTC.

9.42 As a result of concerns over reduced revenue levels, the PTC's tram business units conducted a survey of commuters on trams covering the period May 1998 to July 1998, to gain an indication of the extent of fare evasion since operation of the fare system. While the results of this survey may not be representative of the entire tram system, they revealed ticket irregularities for around 10 per cent of users involving unvalidated tickets (4.5 per cent), not having a ticket (4.3 per cent) and invalid use of concession tickets (1.2 per cent).

9.43 The greater risk of fare evasion on the tram system was further borne out by the market research undertaken with specialist assistance by audit during August 1998 in which 15 per cent of respondents whose last journey had been by tram advised that they had not purchased a ticket. While the reasons for non-purchase were not sought in the survey, responses from public transport users provide a broad indication of a high level of fare evasion on trams.

9.44 Based on the PTC's revenue estimates for tram travel during 1997-98 of \$52 million, if 15 per cent of tram commuters regularly failed to purchase tickets, there would be an annual revenue loss broadly equivalent to at least \$8 million, without taking into account other forms of fare evasion. For example, this figure does not include any fare evasion arising from the use of the 2 most popular ticket classes, namely, daily and 2 hour tickets where any failure by commuters to validate tickets allows the tickets to be used unlawfully for multiple journeys until such time as validation occurs and a time restriction period commences.

9.45 The critical importance of curbing fare evasion is that any reduction in revenue can result in a corresponding increase in the taxpayers' subsidy to transport operations.

9.46 Recent statements attributed within the media to potential bidders for segments of the Victorian public transport network under the Government's planned privatisation program indicated an intention by some bidders to reintroduce tram conductors as a means of addressing issues such as fare evasion and the safety and security of tram users.



9.47 The re-introduction of conductors has also occurred internationally in that:

- In Amsterdam, conductors were re-introduced to the transport system during 1991 partly to address the rising levels of fare evasion which had increased to around 15 per cent of fare revenue. The Amsterdam Transport Authority subsequently considered the re-introduction of conductors to be “*an enormous success*” with fare evasion since decreasing markedly to just around 1 per cent of fare revenue; and
- In Sheffield County, England, automated ticketing machines were abandoned in March 1997 in favour of on-board conductors on trams in view of problems such as increased fare evasion which had “*hit a high of 12%*”.

9.48 As an attempt to mitigate the risks associated with fare evasion across the entire public transport system and particularly on trams, the PTC has progressively over the past 6 months, employed around 300 customer service employees (this number includes former revenue protection officers) who are required inter alia to ensure passengers carry valid tickets. The PTC advised audit that it considered this staffing level to be appropriate based upon the projected frequency of ticket checking required throughout the automated system to manage the extent of fare evasion.

9.49 During the roll out of the automated system across the metropolitan public transport network, the PTC has mainly emphasised an educational approach to its customer service and revenue protection activities. In particular, it has adopted a strategy of generally not fining passengers identified as travelling without a valid ticket during the system implementation period. With this approach, the PTC is currently not in a position to accurately assess the level of fare evasion since the introduction of the system.

9.50 The automated system has now been completely installed across the metropolitan public transport network and it is likely that most transport users have gained experience in use of the system. Accordingly, the PTC will need to assess the desirability of continuing a sole focus on an educational role at the expense of targeting and penalising intentional fare evaders.

9.51 In summary, the above audit commentary on fare evasion indicates that the level of annual lost revenue cannot be accurately determined but based on audit research, could be equivalent to at least 15 per cent, with a minimum annual revenue loss of \$8 million, in respect of tram travel alone. The absence within the PTC of reliable estimates of fare evasion across all modes of public transport precludes quantification of the total system-wide annual revenue loss from fare evasion. A key priority for the PTC should be to establish mechanisms, including use of management information generated by the automated system, for accurately determining the magnitude of fare evasion within the new system and to formulate strategies under which fare evasion can be reduced to tolerable levels.



□ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The PTC acknowledges that the fare evasion is of serious concern. It should be noted however that in the period to end of August, the Automatic Ticket system was being progressively introduced across metropolitan Melbourne. As such not all areas were converted to Automatic Ticketing and the Met scratch tickets were still in use on a number of services. Revenue protection activities were concentrated on educating the public in relation to the new system rather than in revenue enforcement. The presence of Customer Service Employees was diminished due to an industrial dispute in relation to W Class trams. This required CSE's to be diverted to conductor duties on W class trams.

As the system is now entering the fully operational stage and equipment reliability has improved, Customer Service Employee activity is now moving into a "warning" phase. PTC is in the process of developing a strong validation communications strategy which will be targeted to the dual objectives of ensuring passengers understand the need to validate their tickets and to developing a community attitude which is supportive of revenue protection activities.

Refer to earlier comment in relation to fare evasion levels of 15% and equating these to an annual revenue loss of \$8 million.

PTC believes that Customer Service Employees can achieve the same result as would be achieved by introducing roving conductors.

Each public transport system has its own unique characteristics and cultural environment. The rationale for the introduction of conductors in Amsterdam and Sheffield would need to be considered in context.

NEED TO INCREASE THE RATE OF VALIDATION OF TICKETS

9.52 The requirement for users to validate tickets each time they use a public transport vehicle is a significant element of the new automated system in that the validation of tickets:

- is a prerequisite for automatic generation of information covering passenger journeys vital for future planning of public transport operations;
- facilitates the allocation of total fare revenue between the 4 operational divisions of the PTC and, in future, the private sector owners of operational divisions following implementation of the Government's privatisation proposals for public transport; and
- acts as a deterrent to one form of fare evasion for certain ticket classes, such as daily and 2 hour tickets, in that the failure to validate allows the ticket to be used unlawfully for multiple journeys until such time as it is validated and a time restriction commences.



Validation of tickets is a significant element of the new automated system.

9.53 Managers of the PTC's 4 operational divisions expressed concern to audit in relation to the level of non-validation of tickets by transport users and, therefore, the usefulness of management information generated by the automated system. Given this factor, audit was advised that one operating division was considering the installation of electronic counters on trams in an effort to ascertain reliable patronage figures for its business. The collection of this data would also provide a preliminary indication of the magnitude of fare evasion by comparing patronage levels with revenue collections.

9.54 Given the overall importance of the validation process and the concerns of PTC operational management, the 2 surveys undertaken by audit specifically addressed public awareness of, and compliance with, validation requirements of the new automated system.

9.55 In both surveys, public transport users were questioned as to whether they understood why there was a need to validate their ticket at the beginning of every trip on a bus, tram or train. The proportion claiming to know the reason rose from 65 per cent in the May survey to 76 per cent in the August survey. While this trend of increased knowledge of the reasons for validation is encouraging, the PTC must address the fact that a significant proportion of commuters (24 per cent) still advised that they did not know the reasons for ticket validation and correspondingly may have been less inclined to validate their tickets.



9.56 A further survey question related to whether respondents had actually validated their ticket on their last journey on public transport.

Still thinking just of your last journey, did you ...

	August 1998	Last train	Last tram	Last bus
Sample	451	290	130	47
Validated	86%	94%	70%	84%
Not validated	14%	6%	30%	16%

9.57 The survey results indicate that a significant majority of commuters validated their tickets on their last public transport journey. However, the remaining proportion of users who did not validate their tickets (14 per cent) remains relatively high and would have a major impact on the completeness and accuracy of management information generated by the automated system. Of particular concern is that 30 per cent of tram commuters advised that they had not validated tickets on their last trip. This situation may well reflect the point made by audit in earlier paragraphs that there is no compulsion to validate tickets when travelling on this mode of transport except when a customer service officer is present.

9.58 Audit considers that ensuring the validation of tickets by public transport users is a major challenge facing the PTC given that the process of validation represents a fundamental change from previous ticketing arrangements. Urgent attention should, therefore, be directed by the PTC to the implementation of strategies specifically aimed at furthering public education of the importance of ticket validation. The PTC should also design deterrents directed towards motivating public transport users to always validate their tickets.

- **RESPONSE** provided by Chief Executive, Public Transport Corporation
Refer to earlier comments in relation to the allocation of fare revenue.

IMPORTANCE OF CLARIFYING YEAR 2000 ISSUES

9.59 In July 1996, the Government introduced its Year 2000 Policy stating that "*all IT-based contracts should contain conditions that address the Year 2000 issue*". Following the formation of a Year 2000 Risk Management Unit within the Department of Treasury and Finance in July 1998, the Government has attached increasing importance to its requirement that all public sector agencies are effectively managing the risks associated with the Year 2000 millennium bug.

9.60 In line with government policy, the PTC has actively pursued with OneLink since May 1997 the need for incorporation within the contract of conditions which address the Year 2000 issue. To date, such action has not occurred.

9.61 The PTC considers that the automated system must be designated as Year 2000 compliant prior to its acceptance of final commissioning of the system.



9.62 OneLink's position is that Year 2000 compliance is not within its final commissioning obligations and it, therefore, does not feel bound to include this additional requirement within the existing contractual arrangements. However, OneLink has presented the PTC with a management plan in relation to Year 2000 compliance which includes the appointment of a consultant to assist in co-ordinating a compliance program. This program is not scheduled to be fully completed until September 1999. Such timing would appear to be inadequate in view of the overall size and complexity of the system and the fact that certain tickets sold from as early as January 1999 (e.g. yearly tickets) will have an expiry date with the year 2000.

9.63 Very recently, the PTC advised audit that it had reached formal agreement with OneLink on the Year 2000 management plan. It agreed with audit that the time remaining to address this important issue was quite short and acknowledged the importance of careful monitoring of action under the plan.

**IMPLICATIONS OF THE AUTOMATED SYSTEM ON THE GOVERNMENT'S
PROPOSED PRIVATISATION PROGRAM**

9.64 The Auditor-General's May 1998 Special Report No. 57 dealing with the State's public transport reforms included comment on the Government's planned privatisation strategies for public transport. The privatisation program is currently earmarked for implementation during the first half of 1999.

9.65 Discussions with representatives of the Transport Reform Unit revealed that there was a need to resolve issues concerning management information and reporting, particularly related to the accuracy and completeness of revenue data, and the capacity of the automated system to provide a reliable basis to facilitate the allocation of revenue between private companies in the future. The ability to use the system for revenue allocation will also be dependent on increased levels of ticket validation by public transport users as referred to in previous paragraphs. This is particularly relevant with the advent of privatisation in that, where private operators make a determined effort to increase patronage within their area of operations, the system needs to be able to identify the extent of this increased patronage so that any extra revenue generated can be returned to the relevant private operator.

9.66 In the absence of complete management information for revenue allocation, the Unit advised audit that it will still need to rely heavily on market surveys of public transport users to establish a basis for the distribution of fare revenue between private sector transport operators.



9.68 The contract in place between the PTC and OneLink gives rise to a number of other issues relevant to the Government's privatisation program which will require attention because the contract:

- was drafted in a manner which reflects management by the PTC in a public ownership context, rather than by a number of separate (private sector) operators;
- provides for (after final commissioning) payment of ongoing costs of approximately \$36 million per annum to OneLink, a figure which will need to be allocated equitably among the private companies;
- will operate for a term of over 8 years following final commissioning of the automated system; and
- in its present form, may restrict the ability of individual operators to make any future changes to the system such as use of new ticket types and installation of additional ticket vending machines etc.

9.69 A working group comprising representatives of the PTC and Department of Treasury and Finance was established in April 1998 to ascertain the likely impact the contract with OneLink may have on the privatisation program and to determine a process by which any identified problems can be remedied. This working group has cited a number of key issues requiring discussion with OneLink and possible future re-negotiation with it in relation to:

- the need to ensure that all information currently collected and generated by OneLink's automated system in particular, performance information, can be provided on an operator or business basis;
- whether the contract can be readily transferred to several non-government entities;
- a requirement under the system that confidential information applicable to each individual operator is available on areas such as patronage levels and revenue allocation;
- the provision of additional management information reports required by the private operators to be generated from OneLink's system and the potential cost of these reports;
- the ability of the system to be modified to incorporate new ticket types that may be requested by the private operators; and
- the capacity of OneLink's system to be modified to accommodate requests from private operators for system changes.

9.70 The previously mentioned matter dealing with important issue of Year 2000 compliance will also need to be adequately resolved prior to finalisation of the privatisation program.

9.71 It can be seen, therefore, that several important matters arising from the new system have direct implications for the Government's privatisation plans. Along with final commissioning of the system, these matters must be satisfactorily resolved in order that potential bidders for segments of the transport operations are fully conversant with the ramifications of the system on future business operations within a privatised public transport network.



❑ **RESPONSE** provided by Chief Executive, Public Transport Corporation

The revenue allocation principles have been designed to apportion the Met card revenue on the basis of usage. Usage is measured in terms of boardings and passenger distance travelled. The Department of Treasury & Finance developed this revenue allocation model on the principle of ensuring a commercial allocation which was equitable and simple to implement; hence it was decided to use rules based on actual use of the system, that is, boardings and distance travelled. When the Automatic Ticketing system is fully operational much of the data will be derived from this system rather than from surveys.

The establishment of market surveys is necessary irrespective of the management information derived from the Automatic Ticketing System.