NZ TRANSPORT AGENCY
WAKA KOTAHI

In Committee

Board Paper No.	09/10/0269
Submission Date	2 October 2009
Prepared by	Steve Budd Programme Manager, Integrated Ticketing
Recommended by	Dave Brash, Group Manager Regional Partnerships and Planning
Subject	**AUCKLAND INTEGRATED FARE SYSTEM UPDATE**

Purpose

1   The purpose of this paper is to seek four decisions:

  i.   Board approval of the funding for the Auckland Integrated Fare System (AIFS), based on the findings of the comprehensive investigation of funding and financing options undertaken since the June 2009 Board meeting;

  ii.   Board confirmation of the proposed approach to leveraging the NZTA investment in the AIFS solution, as part of ongoing work on the development of a National Integrated Ticketing Programme;

  iii.   Board confirmation of the option it wishes to allow in respect of the ability for third parties to implement alternate ticketing equipment or smartcard ticketing schemes in Auckland, ahead of, or in competition with the AIFS scheme; and

  iv.   Board confirmation of the proposed conditions of funding related to the AIFS programme investment, including programme governance and value gates, and re-assurance in respect of stakeholder and scope planning details.

Recommendations

Funding

2   That the New Zealand Transport Agency Board:

  a. **notes** that the AIFS investigation team has now concluded its analysis. The team included external contractors with commercial and technical skill sets, and the results have been subject to external review by an international ticketing system specialist;

  b. **approves** funding for the AIFS system on the following basis;

    i)   central system funding of $20 million capex at a 100% FAR, (on the basis that the NZTA receives rights to the entire Central System, all ticketing open standards, all related system Intellectual property and operational control, from the Auckland Regional Transport Authority (ARTA) on request);

    ii) AIFS Rail System and Project Delivery related implementation funding at a 60% FAR of the total of $38.25 million capex (NZTA share $22.95 million), and

    iii) annual AIFS operational funding of $8 million at a 60% FAR (NZTA share $4.8m) over ten years after implementation (a 12 year NZTA share of $54.6m);

  c. **notes** the reasons for recommendation set out in paragraphs 116 – 118;

  d. **notes** that ARTA must obtain and service funding for the full balance of AIFS funding of (approx) $20 million for bus equipment, most probably through a loan or lease arrangement;

  e. **agrees** that, as a condition precedent of funding, that ARTA must demonstrate evidence of its ability and commitment to obtain and service funding for the full balance of AIFS funding;

  f. **notes** that, until the conditions precedent in (2)(e) above have been achieved subject to the satisfaction of the Chair and Chief Executive, this funding approval is provisional and does not bind the NZTA;

  g. **notes** that the total required NZTA capex funding in support of AIFS is $42.95million, which is within the maximum capex funding envelope of $44m agreed by the Board in June, and has been provided for in the NLTP;

  Transfer of Ownership of Central System to NZTA

  h. **notes** that in order to give effect to the strategy of leveraging its investment in the AIFS system NZTA needs to control key aspects of the central system functionality;

  i. **agrees** that the ownership of the central system functionality will be transferred to NZTA as soon as reasonably practical, but that ARTA will remain responsible for the successful implementation of the Central System functionality as required to inter-operate with the other elements of the AIFS system;

j. **notes** that all other system assets, in particular the rail, bus and in-depot devices would remain ARTA's responsibility indefinitely;

k. **agrees** that as a condition of funding:

   i) ARTA be required to establish and place all of the Central System functions (including all relevant assets, intellectual property, operations, and contracts) into a specific legal entity that is able to be transferred to NZTA for a consideration of $1.00; and

   ii) A legal agreement between ARTA and NZTA be completed stipulating that ownership of this legal entity will transfer in total to NZTA no later than payment of the final capital payment to the system contractor, being based upon satisfactory delivery and operational performance of all Central System functions, including all supporting services and procedures;

l. **notes** that on the date of the transfer of the ownership of this entity from ARTA to NZTA, an appropriate portion of the opex provided in the NLTP for the AIFS project would also transfer to NZTA. Accordingly, neither NZTA nor ARTA should require additional funding as a result of the transfer;

m. **authorises** NZTA staff to report back with detailed recommendations on the operational elements of this proposal along with the capability and organisational implications before 20 December 2009;

   Approach to Third Party Equipment and Cards

n. **agrees** that the central system and its subsequent leverage nationally, will allow other suppliers to tender to provide smartcard integrated ticketing equipment in other regions in the future.

o. **notes** that as required by the original ARTA request for tenders (RFT), the current bid from Thales assumes a single system environment with inter-operable capability in Auckland – in other words that:

   i) their equipment will be installed on all buses, ferries, stations and wharfs;

   ii) only their specified (ARTA branded) card will be able to be used; and

   iii) all transactions will be processed by the AIFS central system;

p. **notes** that this is the approach taken in the majority of systems internationally. It is considered to minimise project costs and risks and is the investigation team's preferred approach in Auckland;

q. **notes** that media reports suggest that at least one major operator is committed to rolling out its existing smart card technology and system in Auckland in advance of implementation of the AIFS system, potentially compromising the AIFS implementation;

r. **notes** that under its operating contracts for contracted services, ARTA has the ability to require operators to use AIFS compatible equipment once standards have been released;

s. **notes** that there are a number of other steps that could be taken that may influence the extent that the roll out of non-AIFS equipment occurs before AIFS is operational; and

t. **notes** that staff have identified two key options for the Board to consider in relation to the acceptance of third party ticketing equipment in Auckland:

Option A – No Third Party Equipment: *Signal now:*

- that no third-party equipment will be allowed in Auckland once the AIFS system is operational;

- that any operator that introduces new equipment in the meantime will be required to replace it once the AIFS equipment becomes available; and

- that the AIFS equipment will be provided to operators at a subsidised lease cost (subject to confirmation).

Option B – Third Party Equipment Allowed: *Signal now:*

- that operators will be allowed to retain or introduce their own 3rd party equipment and/or scheme (potentially including competing card, and parallel central system functionality) once the AIFS system becomes available *so long as*:

  o the third party scheme is able to support the AIFS card and full set of PT fare products;

  o data on all PT transactions processed by a 3rd party scheme is provided to the AIFS central system to support the proposed national PT Data Warehouse;

  o all third-party equipment is fully AIFS standards compliant and subject to an equivalent performance management regime;

  o competing cards would only work on the devices of operators using the kit associated with them, and would not be supported on the AIFS system;

  o that the technical specifications that Thales intends to adopt in its system will be publically released as soon as possible (so that operators considering the introduction of a third-party scheme can ensure the compatibility of their equipment in advance of the AIFS introduction); and

  o that there are appropriate commercial agreements between ARTA, the Operator(s) and the third party scheme provider to define and protect the overall Auckland ticketing system integrity; and

u. **indicates** your choice between Option A and Option B.

National Leverage of AIFS components

v. **notes** that the comprehensive investigation undertaken since the June Board approval has confirmed the capability to leverage the Central System and intellectual property components of the AIFS investment as the base of a national solution;

w. **notes** that long term options for managing Central System assets, ticketing operational activities and ultimately leveraging any cost recovery and/or commercial opportunities will be prepared for the December Board meeting; and

- **agrees** the principle that regional ticketing systems will be required to support the national ticketing approach as justified by an appropriate comparative business case compared to other options, but where full integration is not justified, as a minimum regional ticketing systems must adopt national card and ticketing system open standards as soon as practical, and actively support development of a national public transport data warehouse;

AIFS Conditions and Gateways

x. **agrees** the following as conditions subsequent to the approval of funding to ensure that the NZTA interests in AIFS are adequately managed:

i. The AIFS Programme adopts the governance and programme management models recommended later in this paper, including:

- use of the SSC recommended project management methodology (Prince2);

- agreed programme gateways and gateway value reviews;

- establishes a programme assurance role, and

- establishes a Project Change Control board with NZTA and the Auckland Transition Authority (ATA) (or successor funding organisation) representation;

ii A requirement on ARTA to ensure the following steps occur to the satisfaction of the NZTA CE:

- completion of the detailed requirements and design phase of the AIFS programme, including re-assurance of full AIFS costs as the next appropriate gateway;

- confirmation of adequate ARTA operational funding to meet all elements of the AIFS project, including required business, stakeholder, and customer change activities, without increases in the levels of NLTP funding agreed in this paper;

- the timely preparation, maintenance and execution of comprehensive stakeholder management and communications plans;

- comprehensive customer evaluation and testing of all front end devices with relevant groups (including card holders, drivers, and re-load agencies);

- the development, agreement, and implementation of revised fares structures, prior to system implementation;

- the review and costing of required changes to fully support the changes to the PTMA that impact on financial settlement processes and the system capabilities required to support these functions;

- the NZTA requirement to review and approve AIFS specifications and standards related to the Central System functions, interface specifications and card standards, to ensure they support both AIFS and national objectives;

- ARTA to develop and maintain programme contingency plans for staged, prioritised ticketing roll-out in the event of cost over-runs and/or constrained funding;

- ARTA to provide support for NZTA funded resources in the AIFS programme to ensure national perspectives are represented; and

- ARTA to support a NZTA case management approach to allow ongoing specification, monitoring, and support of the NZTA interest in the AIFS solution;

- all necessary approvals have been received from the Auckland Transition Authority

y. **Notes** that the AIFS programme will not be funding past detailed design unless the NZTA CE is satisfied that all the conditions described in recommendation (y) above have been completed appropriately by 31ˢᵗ March 2010;

z. **notes** that the Chief Executive has developed a stakeholder communications plan in respect of these decisions for discussion at the Board meeting; and

aa. **agrees** to keep Board paper 09/09/0266 In Committee until the contract for the implementation of an integrated ticketing system has been awarded by ARTA.

Executive summary

3   There have been a significant number of developments since the Board approved funding for AIFS in October 2008 (Board Paper 08/10/0066). These developments have been progressively reviewed, considered, and addressed as appropriate, and reported to the Board. In the June 2009 (Board Paper 09/06/0207), the conclusion of various issues was reported, coupled with the issues in regard to the shortfall of ARC local share funding. As a result an investigation process was approved to establish the best funding and financing options for the AIFS and report back. This Paper provides a summary of the findings, options and recommendations. More specific investigation detail is appended.

4   This paper reports on the results of these investigations and as a result seeks AIFS funding approval for the Central System component at a 100% FAR, and the rail component at a 60% FAR, including the rationale for this investment and these funding arrangements.

5   The investigation team has received very good support from the ARTA AIFS programme team and the preferred tenderer, Thales.

6   After an extensive series of workshops over the past two months, it is evident that Thales is an extremely professional organisation that offers a leading "world–class" solution. They have significant worldwide integrated ticketing domain experience, including at least two significant/complex national systems in current roll–out (Denmark/Netherlands), a very advanced solution approach in comparison to others in this industry, and robust systems engineering and delivery methods.

7   They offer a proven approach and would appear to be an excellent partner in relation to our proposed national approach. Of note is that they have motivation to be successful due to their own high international profile in ticketing, aerospace and defence systems (including in New Zealand).

8   The Central System value investigation summary is that there is evidently a very strong value for money proposition in NZTA funding full rights to the system.

9(2)(b)(ii)

9   It is also apparent that the proposed central solution for AIFS is capable of performing all functions of a national solution as per deployments in the Netherlands (in operation) and Denmark (in development). Therefore we believe that our proposed approach for the use of the central system might best be considered a robust national NZTA lead solution that can operate in Auckland, rather than the other way round. However, while the recent NZTA involvement in the AIFS project has increased the emphasis given to a nationally focussed central system, it has not meant that the existing procurement process has been used for a purpose that was not originally intended. This is confirmed by recent legal opinion from Bell Gully.

10   One of the key findings of the Investigation team is that the proposed Thales central system is highly suited to a national introduction of integrated smart card ticketing, implemented initially in Auckland and then subsequently in other regions over time. If an entirely new nationally focussed tender process had been initiated by NZTA, rather than our joining the existing AIFS process, the central system offered by Thales has precisely the sort of functionality NZTA would have been seeking.

11   The acquisition of full ownership rights to the Central System has three key benefits;

12   It is an essential part of AIFS and is **justified alone** by the needs of AIFS. AIFS is designed to meet the needs of the largest and most complex public transport system in New Zealand, and thus requires almost all functionality that would be needed elsewhere in New Zealand. AIFS cannot be deployed without it.   The cost of the Central system is (as part of the entire AIFS system) has been benchmarked and is comparable with equivalent ticketing solutions.

13   The Central System has proven national system capabilities. It is recommended that NZTA approach this leverage on the basis that most investment in extensibility need only be done when justified by regional demand over time.

14   Our investigations confirm that this additional capability is possible at a marginal cost and will avoid investment in duplicated regional solutions over time. These regional implementations and transaction processing activities are likely to reduce costs overall as deployments and transactions will incur only marginal costs. Another realistic future benefit is the national sharing of future new ticketing capability developments (parking, cycle lockers, etc)

15   It will enable development of one National Public Transport information database to appropriately aggregate all material regional ticketing system data sets. It is expected that with appropriate controls all regions will be able to access and review their own data sets. It will avoid regional duplication of this capability and will facilitate wider information leverage, including service and patronage analysis and route optimisation.

16   We have conducted a thorough investigation into options for supply of operator bus equipment including allowing operators to use third party ticketing system equipment in Auckland (and potentially other regions at a later date). The implications of these options are significant as while they allow choice, they introduce operational and technical complexity and risk. Accordingly rigorous and in depth analysis of these options was undertaken.

17   As part of the investigations it has been confirmed that the choice of a Thales central system under the AIFS project, and its subsequent leverage nationally, does not restrict the ability of other suppliers to successfully bid to provide smartcard integrated ticketing equipment in response to RFTs released by other regional councils in the future. Further it has been confirmed that Thales will provide the interface specifications required to allow third party equipment to be used in Auckland alongside the Thales equipment. The use of third party equipment in Auckland has several implications as it requires standards to be developed, that all equipment needs to be tested for compliance (a potentially high cost exercise to set-up and perform). Although certification may be a chargeable activity it is debatable whether the full system set-up costs would be recoverable. Additionally it is evident that there also need to be robust commercial agreements established to ensure system performance and integrity is preserved, and that the publicly funded regional system and card is not undermined.   An additional implication is that a significant reduction in the AIFS bus equipment order is likely to result in higher unit costs and that additional system complexity may increase transaction unit costs.

18   The analysis of third party equipment options subsequent to the approval to investigate these options further, given at the July Board Meeting, reveals that while it is an option that we ultimately don't recommend, there may be situations where allowing third party equipment in certain controlled circumstances achieves other benefits, such as supporting incumbent or existing schemes and investments. The investigations included gaining an understanding of how, over time, other regional standards and systems might become nationally integrated.

19   Whilst not the primary objective of the investigation, to prepare this paper the investigation team reviewed aspects of the proposed ARTA approach to the AIFS implementation, notably critical factors affecting risks. The team formed the view that while it appears key matters relating to implementation planning, fares reform, scope and stakeholder management are work in progress, further monitoring of these matters would be prudent. The funding conditions related to AIFS governance, programme scope, change and cost control and ongoing implementation planning are thus proposed to provide suitable ongoing NZTA re-assurance on these matters.

20   We have also investigated a number of matters in relation to planning the national approach into the future, and these matters will be updated as that programme progresses. As a key example, standards will need to be adopted and will most likely be based on the European standards that the Thales system is founded on. There may be room for some local consultation and some local variations – notably around card data standards – to support alternative systems and approaches. Depending on our approach and the value involved, transit card standards are likely to be able to be standardised across NZ over time as most regions in New Zealand will probably need to upgrade their smartcards in the near future. This aspect and a number of related matters will be subject to a separate business case as part of developing the national programme. A key aspect is that we need to ensure we have the rights to set and maintain transit card and system standards – via E–Government Unit (EGU) and Standards NZ.

21   A national public transport data warehouse proposed as a minimum objective of a national approach. This will require (over time) that all public transport (only) trip data is required to be aggregated daily into such a system. This database should be run by NZTA (with robust privacy standards and security). It would be accessible by any regional authority (with controls) and is anticipated to become a rich source of information. To achieve this objective will need investment, anticipated as part of the scope of the national integrated ticketing programme. Having a central single database will reduce costs overall by avoiding duplication of investment in disparate local databases.

22   This paper also confirms that we continue to develop a national integrated ticket programme to ensure NZTA are able to maximise benefits from the AIFS investment. This will give effect to a Board principle of leveraging the AIFS to establish open standards and a base processing platform (Central System) and avoid paying twice for the same functionality. Other regional authorities will be free to choose whether to use this national central system functionality when introducing smart card ticketing systems in the future, based on a business case assessment.

23   Our analysis suggests that it will be in their interests to do so. However, if they choose not to they will be required to provide for the export of data from their system to the national data warehouse. To realise these potential national benefits will require active planning and management over a number of years by NZTA. This work will include managing relevant agreements with ARTA and Thales, standards development and compliance, wider commercial opportunities, and provide a support/case management function for AIFS and oversight of any resulting NZTA Board funding conditions.

24   Transfer of ownership and rights to the Central System and related intellectual property and operational control is being investigated in order to give effect to the NZTA national strategy of best leveraging its Central System investment. The following approach to that transfer recognises that, while the original RFT anticipated leverage based on the NZTA principles of inter-operability and ticketing system component re-use, in the absence of any specific definition in these areas at the time, the RFT was based on ARTA procuring all elements of the system. ████████████████████████████ 9(2)(h) ██ This also reflects that the AIFS system is wholly reliant on this capability and that the initial implementation would need to remain focussed on that purpose, although we propose to ensure it is configured in a manner that also suits future wider regional re-use.

25   To manage these functions there is believed to be value in establishing a special purpose legal entity to manage the complex ticketing activities involved and to act as a holding body for the assets and operational functions involved. Investigation on this is underway and there will be ongoing progress report-backs to the Board. Our proposed approach is for that entity to be a Crown Controlled Company initially owned by ARTA. Ownership of that company would then shift to NZTA, along with the relevant operational funding stream, at the earliest appropriate opportunity while recognising that the AIFS system has a dependency on this functionality. Accordingly while this option will ensure that NZTA has control of the central system, it is proposed that ARTA retain full responsibility for development of the required AIFS functionality of the Central System as well as it's testing integration with other AIFS components, and introduction.

26   In the future, under NZTA ownership it would be appropriate to have stakeholder organisations represented in governance roles of such a body. Such a body could also manage equipment standards and compliance matters, and any future commercial leverage opportunities that might arise.

27   We also confirm that:

i)   the programme as constituted and recommended for approval continues to be able to deliver important Auckland public transport system and strategic benefits to customers, operators, and funders; and

ii) the AIFS BCR has continued validity and is very resilient to cost and/or benefit changes;

28   Given the potentially contentious nature of the issues there will also have to be careful communication of these decisions to the Minister and key stakeholders. A draft comprehensive stakeholder communications plan has been prepared for this purpose, highlighting key messages. Initial stakeholder consultation has begun with a Regional Authority workshop and an industry briefing having been held at NZTA offices during September.

Introduction

29   This paper arises from the Board's desire to support more effective public transport, and the complications arising from the ARC funding shortfall. At your meeting in June 2009 you approved "ARTA notifying all AIFS tenderers that it is entering into negotiations with the preferred tenderer for the AIFS, but that any subsequent award of the contract for the implementation of a modified AIFS by ARTA is subject to:

a.   The Chief Executive reporting back by the August or September 2009 Board meeting in regard to the technical, legal, and commercial implications of the funding and financing options, providing recommended approaches for proceeding, including final agreed costs, cost shares, and agreements; and

b.   Board approval of funding of the AIFS programme subsequent to the Chief Executive's report".

30   Since this approval the following activities have been undertaken:

i)   ARTA have announced a consortium of Thales/BNZ/Transfield as the preferred tenderer for the AIFS and have commenced final (contingent) negotiations with NZTA representation;

ii) NZTA concurrently announced conditional approval for the AIFS project to proceed subject to further investigation and the concepts of encouraging inter-operability as well as the AIFS as the component of a national approach to integrated ticketing;

iii) Auckland Operators were briefed at the same time by ARTA and NZTA; and

iv) An NZTA investigation team has undertaken significant investigations of technical, commercial, legal, and funding options, and has developed various analyses and recommendations to optimise the NZTA approach to funding and approving the AIFS (summaries of these investigations are appended).

31   These investigations have also helped to define the necessary future work programme to give effect to a national integrated ticketing programme, and work on initiating this programme is well advanced. The investigations have also created a greater understanding of the risks of the AIFS programme, appropriate to identifying further areas of risk mitigation and support, as appropriate. Lastly, the investigations have created a much greater understanding of the opportunities for national leverage of the AIFS programme, notably the significant proven expertise and negotiated additional functionality offered by Thales, based on Netherlands and Denmark national ticketing systems, and Thales involvement in emerging European open standards.

32   Initial stakeholder consultation was started in late September 2009 with Regional Authorities, Operators, and New Zealand Smartcard Ticketing Industry suppliers. Early feedback from the regional council representatives was generally positive with some concerns expressed regarding the ability of regions to be able to opt in to a national system. This concern was countered by the smaller regions who indicated that they would welcome any assistance available from NZTA in this area as long as it did not create any additional cost pressures. There was a consensus that it is appropriate that NZTA provide a technology lead whilst allowing the regions to retain some independence.

33   This paper reports on the analysis of options recommended for optimal delivery of New Zealand integrated ticketing and what such a programme involves.

AIFS investment summary

34   The AIFS programme will deliver all components of an efficient and effective integrated ticketing and fares system in the Auckland metropolitan region, comprising of smartcard tickets, rail, bus, and ferry ticket vending and reading equipment and related changes and improvements to operational practices. The AIFS programme will also implement a nationally licensed and nationally extensible central systems management facility and operational contracts for local equipment and central system operations support.

35   The AIFS will also undertake concurrent customer related communications and change activities, including fares reforms allowing progressive implementation of journey based fares that will enable more attractive multi-modal public transport and subsequent service efficiency reforms. The programme has a very sound BCR and is consistent with overall Auckland regional transport strategies and wider objectives of being a world-class city.

36   As commented later in this paper, evidence of thorough AIFS implementation planning will be monitored on an ongoing basis through various review mechanisms. It is acknowledged that it is too early in the AIFS programme for these to have been developed at the necessary level of detail. Our reviews to date suggest that the funding and skills to develop and execute suitable plans are available to the AIFS programme team.

Auckland local share funding

37 In October 2008 the NZTA Board approved AIFS Funding (Board Paper 08/10/0066) subject to a number of conditions, including availability of local share funding. In February 2009 the ARC resolved to fund the 40% local share of the total cost, capped at $32 million, subject to reconfirmation of funding by NZTA. Shortly thereafter, the government announced that it would not support the previously proposed regional fuel tax, thus limiting available ARC funding for a number of planned regional transport initiatives, including the AIFS programme.

38 On June 8th 2009 the ARC adopted their new draft LTCCP, including $15.3m intended for AIFS (as part of its multi-modal capital funding for ARTA) and this is scheduled for formal adoption on 30 June 2009. This reduced local share funding effectively means that AIFS cannot be funded on the same basis as previously approved by both NZTA and ARC. Various options to address this funding shortfall have now been investigated and are outlined below.

39 These funding options were based on the following key premises:

a. That AIFS is still an appropriate public transport regulator intervention and that continued ARTA/ARC and NZTA investment is justified;

b. That AIFS is appropriately scoped and should not be reduced in overall scope and cost, and that part funding or significantly extended staging are unacceptable options as they introduce procurement process issues as well as delayed benefits and higher overall project costs;

c. NZTA has had a consistent and open interest in AIFS as the lead/pilot of a national ticketing approach, and that funding approaches that give greater effect to that, and are consistent with the previously approved national ticketing principles, are appropriate for consideration; and

d. That the procurement of AIFS has been appropriate in scope and conduct and that the funding options considered and approved should seek to support this procurement.

40 Under the proposed approach ARTA will retain responsibility for all on-bus and depot devices and equipment. As agreed with ARTA, the proposal put to the NZTA Board in June was based on the assumption that NZTA would not be required to contribute any funds towards the cost of acquiring this equipment (estimated to cost roughly $20m). This cost was to be met either directly by ARTA, or by requiring operators to purchase this equipment from ARTA or procure their own equipment.

41 ARTA would prefer to purchase that equipment upfront, and gift or lease it to operators (an option we support from a policy perspective). However, ARTA does not have funds budgeted to do this, and is actively investigating banking finance, combined with the recovery of 60% of equipment costs from operators. ARTA is confident that it will have this resolved in the next 4-6 weeks and we propose that this is made a condition of funding.

42   An alternative funding approach is to allow third party equipment to be procured by operators, including forms of competing smartcard ticketing schemes was a major part of the investigation and these options are evaluated later in this paper.

Investigation approach

43   The Investigation team has now gathered the information needed to make its recommendations:

i)   A significant amount of background tender and bid material has been reviewed;

ii)   Numerous meetings have been held with ARTA staff and Thales representatives; and

iii) Thales has responded to around 30 detailed written questions.

44   The approach to the investigation was based on performing a due diligence on the options in respect of the following criteria:

i)   Willingness of the AIFS preferred tenderer to enter into a revised commercial arrangement with ARTA to give effect to the preferred funding option(s), and licensing agreements in relation to national use;

ii)   Assessment of the technical feasibility, cost, and value for money of securing use of the Central System for processing national smartcard ticketing transactions;

iii) Financing options and appropriate commercial approaches; and

iv)   Establish the core components of an appropriate delivery agreement with ARTA that will give effect to the preferred funding and financing option(s).

Principles to guide ticketing investment

45   Early development of ticketing principles for New Zealand has sought to underpin the above logic. In July 2007 the LTNZ Board adopted the following five guiding principles:

i)   Regional Councils to specify smartcard system requirements, including requirements for ensuring confidentiality in relation to access to, and use of commercial data;

ii)   Smartcard system operation not to be run by a public transport operator;

iii) Regional Councils to use open procurement procedures to select smartcard system contractors;

iv)   Regional Councils to be encouraged to seek economies of scale by sharing clearing houses and other elements of smartcard systems; and

v)   Regional Councils and their smartcard system contractors to work towards interoperability.

46   These five guiding principles are still relevant to this investment. The proposed funding package and national approach and the re-usability of components are viable and facilitated by the standards based approach proposed. The Thales proven European national experience and componentised mature systems approach, coupled with the proposed National Programme approach are also appropriate in this context.

Analysis of Thales Offer (refer Attachment 1)

47   The investigation team considers that the system offered by Thales is of high quality and includes a Central Systems application that is a mature and flexible offering compared to much of the ticketing industry. The Thales staff involved are professional and demonstrate a strong 'partnership' approach to the relationship with ARTA and NZTA.

48   We have sought and obtained both proof of concept and proof of workability – although you can never guarantee this until built – the systems proposed are off-the-shelf and proven technology suited to our PT environment.

49   The Thales central system (refer Attachment One) can be re-used as the core of other regional solutions at relatively low cost. The central system direct costs of introducing a new region are likely to be of the order of $0.5m. A common technical architecture framework would require minimal additional capacity to introduce additional regions. This compares well to the central system related costs of the recent Christchurch system of around $2m.

50   The NZTA investigation team focussed only on reviewing the AIFS preferred tenderer (Thales) bid in depth and thus the team are unable to comment on the unsuccessful bids. None the less, it is evident that the Thales solution is a very sound proven in service solution, supported by a mature and experienced delivery approach. Equally we were impressed by the Thales staff and their commitment to partnering and delivering this solution in New Zealand.   They have considerable experience in the delivery of more complex, larger solutions. We consider that their organisation is fully capable of delivering the AIFS system.

51   A part of the AIFS bid process required components that were already proven in service. Equally the AIFS bid process has been very cautious and specific, focussed on mitigating equipment risks that have been evident in recent Australian implementations. The investigation team formed the view that the Thales bid is likely to be very good value for money on quality, reduced risk, and solution maturity, rather than just price. Additionally it is evident that the Thales development, and delivery of open standards based national solutions in the Netherlands and Denmark, gives a rich base for New Zealand to leverage. Pleasingly we have been able to negotiate national rights to the system and will be able to readily include appropriate national configurations to allow later extensibility. Our investigations demonstrate that with this pre-planning, later regional extensibility is at a markedly lower cost that would otherwise be the case, with commensurate operations efficiencies and shared costs for future capability enhancements.

52   In summary, Thales looks to have been a sound choice of preferred tenderer and the system on offer appears suitable for both ARTA and NZTA requirements.

NZTA involvement logic

53   There are a number of compelling reasons for NZTA (and previously LTNZ) and Regional Authorities such as ARTA to have direct involvement in public transport ticketing in New Zealand. These range from ensuring market optimisation and achieving best value for money from significant public transport subsidies, to achievement of public transport policy objectives, including service delivery and contract controls and access to good information.

54   There have been previous attempts at integrated ticketing in Auckland and an operator consortium (Auckland Integrated Ticketing Limited – AITL) was established in 2003 with limited success. In 2005 the ARTA Board declined an AITL proposal to provide integrated ticketing on the grounds that while it required funding from ARTA, it did not permit ARTA to deliver its policy objectives.

55   For policy and effectiveness reasons most successful world-wide ticketing and fares initiatives have been led by funder/regulators. This intervention has assisted to deliver key success factors, such as the ability to integrate intensely competitive operators, as well as integration with wider public transport planning initiatives, such as fares and service reforms. Additionally, it is evident in many overseas case studies that this central leadership approach provides significant long-term value for money advantages through effective area-wide planning, the development of common standards to allow full operator/mode integration, the efficient conduct of large-scale competitive procurement, and cohesive/effective stakeholder change communications. A further critical success factor has been the ability to equitably manage disparate Operator commercial interests, and mitigate any tendency for a dominant Operator to engage in market behaviours that might result in compromised, ineffectual implementation and higher long-term system costs.

56   The enablement of fare and services integration is widely regarded a critical component of major ticketing and fares collection improvements. Jeremy Meal of MVA Consultancy, a UK based Integrated Ticketing Consultancy has been recently involved in reviewing key components of the AIFS process and our National approach.   He comments, "Hence a vital argument in provisioning integrated ticketing, is that a system fit for purpose may allow large savings through the optimisation of the transport network…"

57   The delivery of this optimisation is typically only achieved by careful co-ordination of activity between planners, stakeholders, and delivery organisations. The AIFS initiative has these optimisation activities as key programme deliverables.

Public Transport Improvement Building Blocks
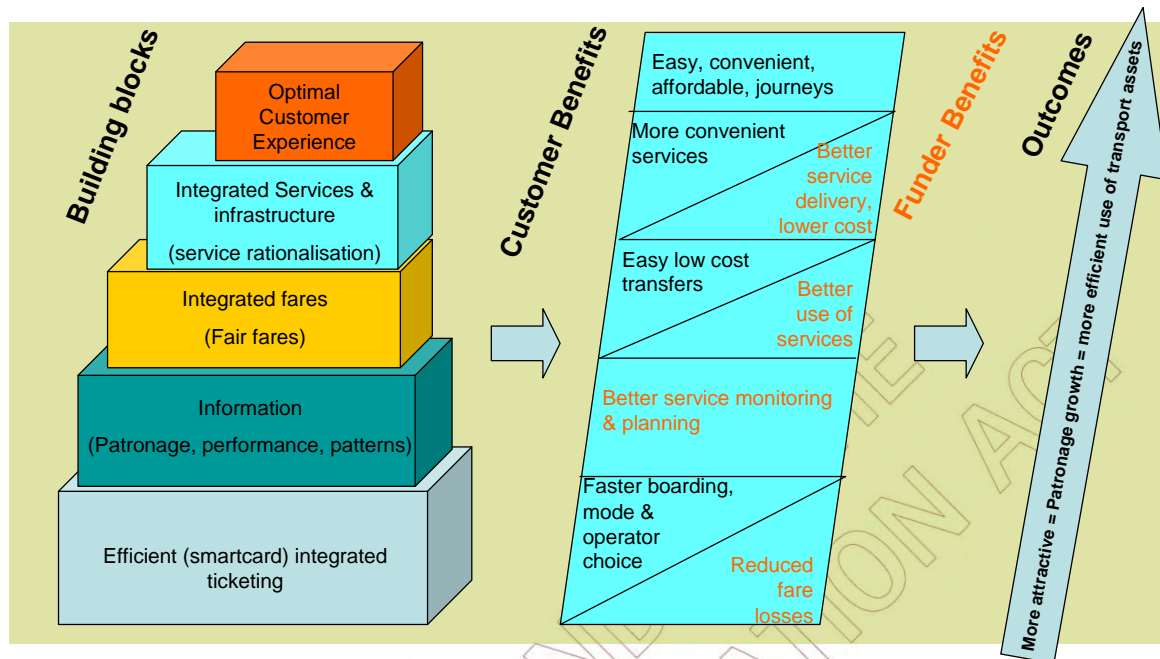
58   The ability to deliver to these building blocks is enhanced by the evolution of ticketing technology, enabling ticketing and fares to become far more effective and responsive policy instruments. Not only is fare collection more efficient, but the capture of rich travel information enables effective monitoring with enhanced ability to plan and respond. A good example of these reforms is Singapore where changed travel behaviour resulted from service reforms and led to a significant reduction in the bus fleet (c.600 buses).

Funding option analysis

59   In the event of AIFS not proceeding in any form, NZTA would need to decide whether it wished to initiate procurement of a national ticketing system.

60   If NZTA chose not to initiate a national procurement, or take any other related steps, a comparatively unmanaged migration towards smart card ticketing would occur. This would almost certainly see existing ticketing system providers implementing their solution on allied bus operators' services in Auckland, and over time potentially in smaller cities and on other PT modes in Wellington. This would make moves towards integrated ticketing arrangements considerably more difficult, as other bus companies would be highly unlikely to be willing to join their competitor's scheme, and would therefore likely seek to implement their own alternative smartcard ticketing solutions. The broader strategic benefits sought from AIFS would therefore be largely lost, or at a minimum delayed.

61   If NZTA did opt to procure a national smart card ticketing system soon after abandoning the AIFS project, the strategic benefits sought from AIFS could most likely be ultimately achieved in Auckland and other regions.

However, a relatively significant delay would be inevitable – potentially of up to two years – whilst NZTA went through the procurement steps that ARTA has already undertaken. This delay would likely see further roll out of independent smart card schemes, increasing the need to accommodate third party schemes in each region. NZTA would also face greater costs under this option. Further, there is a relatively strong risk that commercial interest in NZTA's procurement would be less than ARTA received due to a heightened perception of the risks involved.

Transfer of ownership of central system to NZTA

62   In order to give effect to the strategy of leveraging its investment in the AIFS system NZTA needs to ultimately own all key aspects of the central system functionality. However, we need to assess when and how it is desirable for NZTA to take ownership of that functionality for several reasons.

63   Most importantly, the central system will not be operational the day after ARTA enters into a contract with the supplier. A key element of the AIFS cost is the development work needed to tailor the central system to meet NZTA and ARTA's needs. We believe ARTA is best placed to oversee that development process as only it can ensure that all elements of the full ticketing system provided – which is greater than the central system – works as required.

64   9(2)(h)

65   We therefore recommend that ownership of the central system be transferred from ARTA through the following process:

- ARTA continue to procure the AIFS as originally planned and enter into the Project Agreement with Thales.

- ARTA be required to incorporate a new, wholly-owned subsidiary (Note ARC material transaction approval would be required. A possible fall-back position is that ARC owns the company).

- This company would automatically be deemed to be a Council-Controlled Organisation (CCO) under the Local Government Act and therefore covered by the provisions of that Act.

- ARTA be required to transfer and assign (essentially novate) the entire Project Agreement to the CCO. This requirement would cover all relevant assets, IP, operations, and contracts (including all contracts with Thales).

- The CCO entity be required to be operationally independent from ARTA (but it could be co-located).

- A legal agreement be established between the ARC, ARTA and NZTA which stipulates that:

  i. ARTA and NZTA will jointly develop and agree a Statement of Intent for the CCO (which NZTA would want to ensure included a strong focus on the intention of creating a national system which other regions can utilise).

  ii. ARTA will place a NZTA representative (nominated by the Chief Executive) on the Board of the CCO.

  iii. Ownership of all of the shares of the CCO will automatically be transferred from the ARC to NZTA for nominal consideration (of say $1) within 30 working days of NZTA formal notice of requirement.

  iv. Contemporaneously, the CCO transfers and assigns to ARTA all of the front–end devices and systems (levels 1 and 2 in the architecture diagram below) and "regional" assets, functions, and contract rights where relevant.

- Once ownership of the shares of the entity shifts to NZTA, the entity would automatically be deemed to be a Crown Entity Subsidiary under the Crown Entities Act. (Note Ministerial approval is required to purchase the shares and transfer a portion of the funding stream from the NLTF to the new subsidiary.

- An existing memorandum of understanding, and the conditions of funding proposed herein mean that NZTA will be able to ensure that appropriate national considerations are included in the Central System design, configuration, and implementation, regardless of when this option is exercised.

Figure – Overview of System Architecture
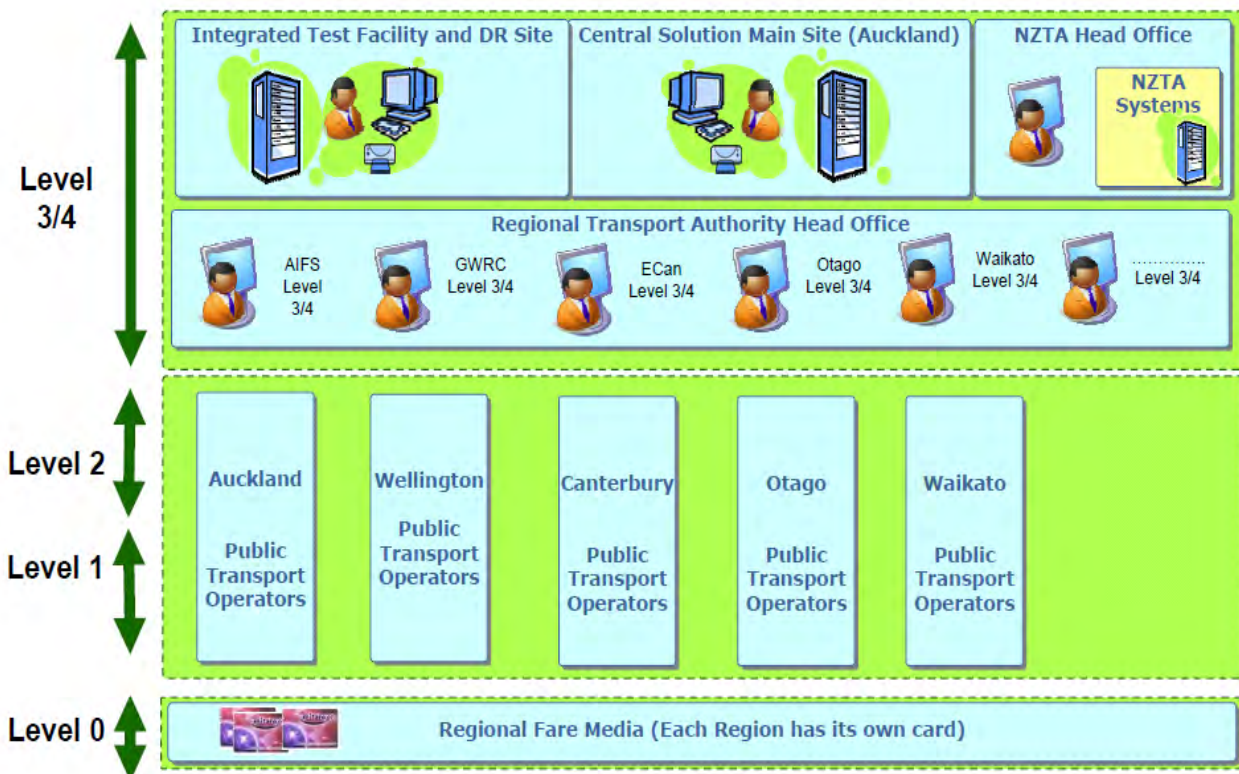
66   Note, with regard to the figure above:

- That the level 3/4 functions shown are located in one physical environment, but that the regional functions are performed online to the Central System;

- Levels 1 and 2 represent local devices and Operator depot systems; and

- That while each region would issue its own branded cards, there is the potential over time to introduce a standard inter–operable format to allow inter–regional use.

67   The agreement to enter into a legal agreement between ARTA and NZTA would be a condition of funding. That agreement would stipulate that ownership of the legal entity would transfer to NZTA at its request after a minimum period of time (i.e. NZTA would have a 'call option'). Note that the Thales contract to operate the central system would shift to NZTA along with all other assets held by the legal entity. A portion of the AIFS operational funding included in the NLTP would therefore need to transfer to NZTA at the same time.

68   ARTA has indicated that it is willing to accept this approach.

69   Further work is required to finalise a number of the detailed aspects of this proposal option. However, we have undertaken sufficient work to be confident that no insurmountable issues exist. We recommend that you agree to this general approach for enabling the transfer of the AIFS central system to NZTA, but direct the NZTA Chief Executive to prepare a subsequent Board paper providing more detailed recommendations on the implementation of this approach.

Third party equipment integration options

70   One of the more tricky elements of this project is what decision to take around the acceptance of third–party ticketing systems, equipment or cards in Auckland.

71   As required by the request for tender (RFT), the current bid from Thales assumes a single system environment with interoperable capability – in other words that:

i)   their equipment will be installed on all buses, ferries, stations and wharfs;

ii)   only their specified (ARTA branded) card will be able to be used; and

iii)   all transactions will be processed by their central system.

72   This is the approach taken in the majority of systems internationally. It is considered to minimise project costs and risks and is the ARTA team's preferred approach in Auckland. However, it is technically possible to allow elements of other ticketing systems in Auckland. Several possible options exist.

73   It should be emphasised that the procurement of a Thales central system under the AIFS project does not restrict the ability of other suppliers to successfully tender to provide smart ticketing equipment in other regions in the future. For example, if GWRC tendered to introduce an integrated smart card ticketing system in Wellington, any existing suppliers of ticketing equipment would be able to tender to provide the remaining equipment required. The question addressed by this section is whether third-party ticketing systems, equipment or cards should be allowed in Auckland to operate in conjunction with the Thales equipment and system.

Context

74   Media reports suggest that at least one major operator is committed to rolling out its existing smart card technology and system in Auckland in advance of the AIFS roll out (for example, the article in the Independent on 10/9/09). In time ARTA will be able to require operators to install the new Thales equipment on contracted services, and negotiate with them to do so on commercial services (or if necessary require them using provisions in the Public Transport Management Act (PTMA)). However, that clearly cannot occur before the AIFS/Thales system is up and running, which is not expected to fully occur until 3 years after a contract is entered into.

75   In the meantime, ARTA has the ability under its operating contracts for contracted services to require operators to use AIFS compatible equipment once the relevant standards have been released. However, this power may be difficult to enforce and could be unpopular with some operators. Further, there are a number of steps that ARTA and NZTA could take to influence the extent of roll out of non-Thales equipment.

76   In taking a decision on its preferred approach to the acceptance of third party equipment in Auckland the Board needs to focus it attention on the situation that is likely to exist when ARTA is wanting to begin to bring the Thales system into operation.

77   Some of the key tools available to ARTA to influence the uptake of non-Thales equipment before AIFS is operational include:

Short Term

• Stipulation of smart card technical standards (based on Thales specifications) in all new Auckland operating contracts (for contracted services) as soon as possible;

• The provision of clear public statements on its intended approach to the acceptance of 3rd party equipment once the Thales system is in operation (whether third party equipment will be allowed, to what extent, and under what conditions); and

• Clear public statements on the benefits of the Thales system and equipment for customers and operators.
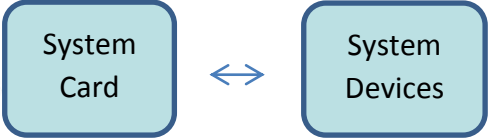
Longer Term

- Ensure that the Thales-provided equipment is attractive to operators:

  o   provide it at a discounted cost, or for free;

  o   include attractive maintenance arrangements; and

  o   attach additional products and services to the Thales card;

- Minimise the cost to operators of replacing their existing equipment with Thales equipment;

- Negotiate with operators to use the Thales equipment once it becomes available, or use PTMA controls if necessary; and

- If third party equipment is to be allowed, minimise the cost faced by operators to make their existing equipment interoperable with the Thales system.
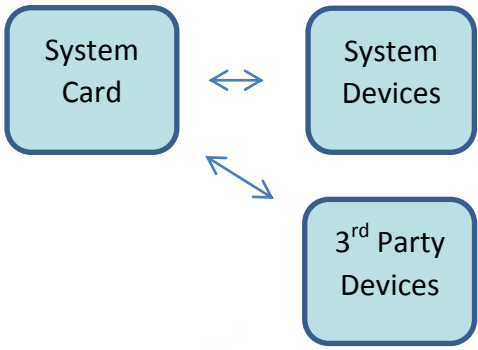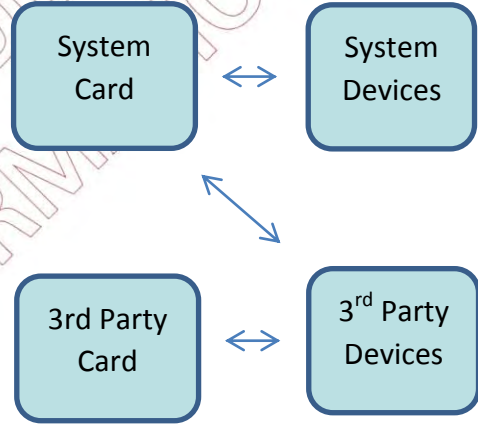
78   Note that in practice most of these possible actions are not directly available to NZTA. However, the Board can encourage or require them through the funding process.
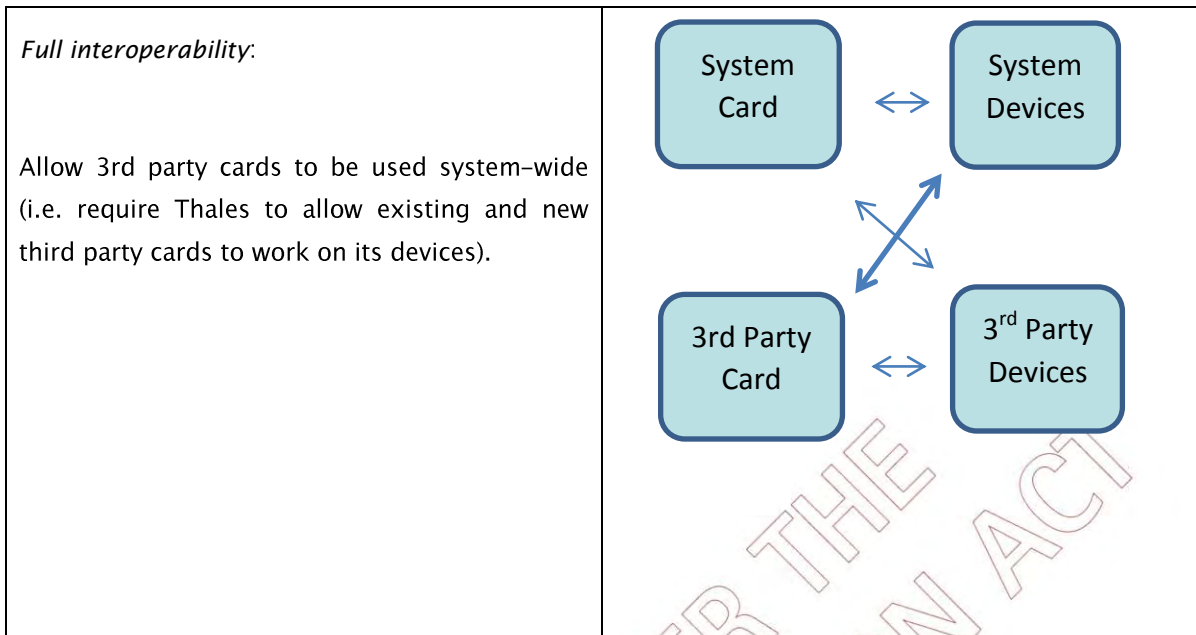
Options for allowing third party equipment, cards or systems in Auckland

79   Once the AIFS/Thales system has been brought into service, ARTA has a number of possible options open to it for accepting third-party equipment, cards or systems. These options can be seen as a series of cascading steps, each moving further away from the most cost-effective approach of a single end-to-end Thales system. The key options identified by the investigation team are outlined in the table below.

Table: Options for the Possible Acceptance of Third Party Equipment

Single Universal System: Only AIFS equipment and the one system card would be allowed.	System Card ↔ System Devices

3rd Party Bus and Depot Devices: Allow individual operators to introduce complete packages of on-bus devices and supporting depot equipment – managed by Thales central system. I.e. an operator rolled out in Auckland before the AIFS equipment was available they could continue to use all hardware that had been installed. But do not allow competing cards. And require **all** transactions to still be processed through the AIFS central system.	**System Card** ⟷ **System Devices** **3rd Party Devices**
3rd Party Scheme: Allow operators to introduce their own full 3rd party scheme, including competing card, and parallel central system functionality. I.e. let any operator that introduces a third party scheme in Auckland continue to operate so long as their readers can accept the AIFS card and data can be transferred between the two systems. The system card would be required to work on all devices. But competing cards would only work on the devices of operators using the kit associated with them. Data would transfer between the two central systems, and allow cash reconciliations to be made. This presents some technical complexities, and dependencies between separate systems	**System Card** ⟷ **System Devices** **3rd Party Card** ⟷ **3rd Party Devices**

Full interoperability: Allow 3rd party cards to be used system-wide (i.e. require Thales to allow existing and new third party cards to work on its devices).	System Card ↔ System Devices 3rd Party Card ↔ 3rd Party Devices

Commercial requirements of third party equipment and/or card schemes

80 Regardless of the specific option chosen, staff recommend that if third party equipment is to be allowed in Auckland there should be several non-negotiable requirements:

i) Any third party scheme must support the system card and full set of PT fare products provided on it to preserve the viability of the system scheme and provide customer convenience;

ii) Data on all PT transactions processed by 3rd party scheme must be provided to NZTA central system to support the proposed national PT Data Warehouse (and associated information leverage); and

iii) Any third party cards / kit must be:

  o Fully tested and approved to meet system standards and data integrity/ end to end interface specifications; and

  o Subject to an equivalent performance management regime to the system operator to preserve system reliability and overall scheme integrity.

81 Note that the cost of configuring third-party equipment to meet the prescribed standards, and the associated testing costs required is likely to be significant. This could be an NZTA Integrated Ticketing Programme function although a decision will need to be taken as to who will fund this capability NZTA, ARTA, or the ticketing industry user. The cost of establishing such dedicated testing environments and processes to provide the required rigour is estimated at a maximum of $750,000.

Assessment: Choice of approach once the AIFS system is operational

82   As noted, there are limits on the ability of ARTA or NZTA to prevent the roll out of non–Thales equipment before the AIFS equipment can be made available. However, some controls do exist.

83   Of the four different options outlined above for accepting third–party equipment once the Thales system is operational, NZTA staff prefer the single system option from the perspective of minimising costs and risks. If announced early, it may also reduce the likelihood of operators choosing to roll-out in Auckland before the AIFS system has been introduced. However, this option is likely to meet with very strong resistance from some stakeholders, both when announced and when the AIFS system is brought into service. In practice this option may therefore prove difficult to put in place.

84   The second option of allowing packages of third–party bus/ferry equipment and depot management devices is considered the next least risky from a technical and cost perspective. It would allow operators with existing equipment to retain it (and operators with specific preferences to procure alternative their third party equipment directly).

      However, operators with existing systems would not be able to retain their current card, and would therefore lose the ability to provide non–PT micro payment services. This option is not considered likely to substantially address stakeholder concerns. But it would allow ARTA/NZTA to head off criticism that they were causing new equipment to be scrapped. Given that this option is not likely to substantially address stakeholder concerns it is questionable whether it offers any benefit over option 1.

85   The third option of allowing a full parallel system is technically feasible, but it introduces some complexity. It is likely to be more attractive to any existing operators that have recently rolled out new equipment, as they could retain their cards and any associated non PT business models.

86   However, this option is less desirable from a number of PT perspectives:

      - The existence of multiple cards could cause confusion (people trying to get on a train with a bus operator's card) and reduce the ability of ARTA to effectively market its MAXX integrated fare products;

      - It would be easier for operators to create new products on commercial services to compete with ARTA's integrated fares ("bus all the way to the CBD and save 10%") and unreasonably undermine contract services; and

      - The existence of a parallel card and central system would reduce NZTA's ability to introduce non PT products for its card, and the revenue earned from the card float; and

      - It will cost more to set-up and manage.

87   The fourth Option is considered very problematic and is not recommended. This option
      would effectively place an ongoing obligation on Thales to reconfigure its card readers to
      accept any new cards proposed by an operator, regardless of their design. This is not
      something Thales could reasonably be expected to commit to doing under a fixed price bid.
      Further it would create significant technical difficulties and high costs if multiple additional
      cards were proposed.

Possible Approaches

88   We consider that there are two key possible approaches open to the Board for managing this
      issue:

Option A – No third party equipment: Signal now:

- that no third-party equipment will be allowed in Auckland once the AIFS system is
  operational;

- that any operator that introduces new equipment in the meantime will be required to
  replace it once the AIFS equipment becomes available; and

- that the AIFS equipment will be provided to operators at a subsidised lease cost (subject
  to confirmation).

Option B – Third party equipment allowed: Signal now:

- that operators will be allowed to retain or introduce their own full 3rd party scheme
  (including competing card, and parallel central system functionality) once the AIFS system
  becomes available so long as:

    o   the third party scheme is able to support the AIFS card and full set of PT fare
        products;

    o   data on all PT transactions processed by a 3rd party scheme is provided to the AIFS
        central system to support the proposed national PT Data Warehouse;

    o   all third-party equipment is fully AIFS standards compliant and subject to an
        equivalent performance management regime;

    o   competing cards would only work on the devices of operators using the kit
        associated with them, and not supported on the AIFS system;

    o   that the technical specifications that Thales intends to adopt in its system will be
        publically released as soon as possible (so that operators considering the
        introduction of a third-party scheme can ensure the compatibility of their equipment
        in advance of the AIFS introduction); and

    o   there are appropriate commercial agreements between ARTA, the Operator(s) and
        the third party scheme provider to define and protect the overall Auckland ticketing
        system integrity.

89   A key judgement facing the Board is whether you consider that it is in practice possible to effectively dissuade operators from any significant roll-out of third-party equipment in Auckland over the next three years.

90   If you consider that it is possible, Option A would appear preferable. However, the risk under this option is that key operators may chose to roll out alternative schemes regardless of NZTA's stated policy. If this occurred NZTA and ARTA would have lost the ability to stipulate the conditions under which third-party equipment will be accepted in advance of operator's investment decisions. NZTA and ARTA would therefore have lost the 'high ground' of being able to state that operators had been fully informed before introducing their chosen technologies.

91 In turn, the key risk of Option B is that more third party equipment will be introduced than would otherwise have been the case (requiring a reduction in the number of items to be provided by Thales, and possibly increasing unit prices). In addition Option B:

- may lead to delays in the full roll out of AIFS (due to the requirement on operators to have their equipment tested and approved);

- may lead operators that have opted to introduce new equipment to seek compensation for the costs they face to ensure compatibility and compliance; and

- may give rise to public confusion and potentially reduce demand for the system card (if the third party schemes have already captured a large customer base).

Legal risk

92

9(2)(h)

## Consideration of AIFS programme stakeholder, scope and control risks

93   As mentioned earlier there are a number of matters relating to the AIFS that the investigation team considers that it would be prudent for NZTA to monitor on an ongoing basis, and hence the funding conditions contained in section bb of the recommendations are proposed to manage these risks.

These include monitoring:

a   That all necessary approvals have been received from the Auckland Transition Authority; and

b   The AIFS Programme adopts the governance and programme management models recommended later in this paper, including;

- use of the SSC recommended project management methodology (Prince2);

- agreed programme gateways and gateway value reviews;

- establishes a programme assurance role, and

- establishes a Project Change Control board with NZTA and ATA representation.

c   A requirement on the ARTA CE to ensure the following steps occur to the satisfaction of the NZTA CE;

- completion of the detailed requirements and design phase of the AIFS programme, including re-assurance of full and final AIFS costs as the next appropriate gateway;

- confirmation of adequate ARTA operational funding to meet all elements of the AIFS project, including required business, stakeholder, and customer change activities, without increases in the levels of NLTP funding agreed in this paper;

- comprehensive user testing of all front end devices with relevant groups (including card holders, drivers, and re-load agencies);

- the timely preparation, maintenance and execution of comprehensive stakeholder management and communications plans;

- the development, agreement, and implementation of revised fares structures, prior to system implementation;

- the review and costing of required changes to fully support the changes to the PTMA that impact on financial settlement processes and the system capabilities required to support these functions;

- The NZTA requirement to review and approve AIFS specifications and standards related to the Central System functions, interface specifications and card standards, to ensure they support both AIFS and national objectives;

- ARTA to develop and maintain programme contingency plans for staged, prioritised ticketing roll-out in the event of cost over-runs and/or constrained funding; and

- ARTA to provide support for a NZTA funded resource in the AIFS programme to ensure ARTA to support a NZTA case management approach to allow ongoing specification, monitoring, and support of the NZTA interest in the AIFS solution.

d   Using a Gateway approach to ensure that all of the above, including the conditions subsequent have been completed appropriately by 31st March 2010.

e   Not withstanding the above, it is noted that AIFS programme lifecycle anticipates development of the appropriate plans per the Programme Lifecycle shown below;

At inception, the AIFS team adopted four-step process when envisioning the overall programme to delivery:
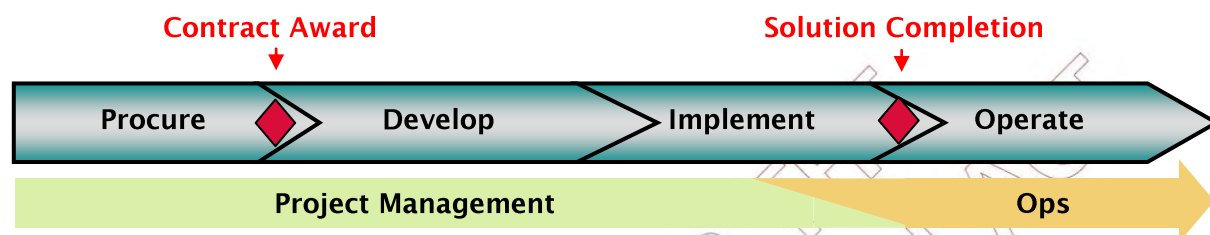
The **Procure** phase covers the process from initial conceptualisation through to Contract Award

The **Develop** phase covers contractor mobilisation until Solution User Acceptance Testing

The **Implement** phase covers Pilot testing through to Client commissioning

The **Operate** phase is for the full operating period until project retirement

Risks

94   Integrated ticketing initiatives are complex technology and business change project, usually played out in high profile commercial, political and public environments, and have been proven to be very high risk, although outright failure is rare. Mitigation of typical ticketing project risks and anticipated AIFS specific risks are proposed. These risks are discussed in this section. The process followed to date has minimised risks, but a complex project of this type and in the current environment inevitably has a high risk profile. Key risks are:

- That the ARTA decision is subject to a time-consuming legal challenge by an unsuccessful solution supplier;

- That an alternative ticketing solution is attempted to be deployed in competition to AIFS.

- That Operators may not be fully supportive;

- That AIFS customer and change management activities are not well executed;

- AIFS fares are not appropriately re-structured in advance of deploying the full system, to maximise efficiencies while minimising implementation complexity; and

- Time delays through poor planning with resultant cost over-runs.

95   The above risks are informed by overseas experience. It is evident that ARTA have pre-planned for many of these risks and have developed appropriate contingency plans to anticipate, mitigate and manage these. These include an experienced team, proven vendor and robust attention to equipment specifications, operational services and performance incentives. Some areas are still to be fully developed in the areas of stakeholder management and fares rationalisation, and these areas are proposed for further monitoring (via proposed conditions of funding) through case management and governance methods.

96   In regard to the above, we have received evidence that ARTA have an appropriate risk management approach (developed by Booz and Company), including a risk register that is regularly updated.

NZTA financial risks

97   The funding condition related recommendations set out in this paper effectively require ARTA to provide NZTA with an assurance that it will not seek further NLTF funding in relation to the AIFS project. While some financial risk is likely to remain for the project as a whole, NZTA should therefore not face any risk itself.

98   The possibility that ARTA will re-approach NZTA for further funding once the project is underway, despite providing that assurance, cannot be ruled out. However, the AIFS project is no different in that regard to any other mid to large-sized project co-funded through the NLTF.

99   The following table outlines the key areas of financial risk for the AIFS programme, and in turn it's funders;

Risk	Likelihood	Severity	Comment	Mitigation	Residual Risk
Forex	Moderate	High	Difficult to manage	Forward cover for future payments	Moderate (unless funding delayed) then high
Programme Delay	High	Moderate	External delay is hard to manage	Good planning and communications	Moderate
Inadequate specifications	Low	High	Very detailed specs	Fixed price	Low
Scope Creep	Low	Moderate	Detailed specifications minimise risk	Change Board	Low

100   Methods to mitigate financial risks to NZTA from AIFS cost increases have been considered and the mitigations (largely of matters within ARTA control) are embodied in the proposed controls and governance conditions of funding. Further detailed third–party cost and risk assessments have been considered but do not adequately address the more significant areas of residual risk in the above table, which are largely derived from costs introduced by delays from events that ARTA cannot manage.

101   For this reason and the high BCR of the AIFS initiative, we do not recommend formal capping of AIFS funding, although we consider that adequate contingency has been allowed in current AIFS budgeting.

NZTA reputational risks

102   The following NZTA reputational risk analysis has been prepared to consider the major areas of risk that might arise from the AIFS decision options, and the appropriate mitigations that we recommend;

Risk	Likelihood	Severity	Comment	Mitigation	Residual Risk
Adverse Auckland re–action to not funding AIFS	Depends on decision	High	Hard to manage – likely to be enduring comment	Political and media communication	High
Adverse (dis–affected) suppliers re–action	Depends on decision	Medium – will pass, not a priority public interest matter	Easier to manage – due process run, comments not justified	Political and media communication	Moderate Some difficulties with stakeholders in short term
Adverse Operator reaction	Depends on decision	Moderate	Will not be universal comment	Public comment – recognition that comments are self interest	As above
Poor delivery performance by ARTA	Low – Minor	Moderate	NZTA reputation affected	Proposed NZTA controls approach	Low
National approach value not recognised	Low	Minor	Unlikely – inconsistent with most comments to date and other govt actions	Public comment re value proposition and previous comments by many stakeholders	Low
National approach standards are not universally accepted by all suppliers	Medium – high	Minor	Comments will be: higher costs for some, not fair, Thales get advantage	Comment re consultation, open standards and "opportunity" to be compliant, that the most universal open standard will be used. Value for money for public.	Moderate

103 In summary NZTA risks in relation to AIFS are primarily:

- ARTA delivery is compromised as above;

- That the NZTA approach to developing a national solution is challenged, potentially in association with the AIFS decision;

- The AIFS decision creates a situation that results in some vendors being unwilling to compete for future business in New Zealand;

- Funding risk from the potential for specification changes and time delays resulting in requests for additional AIFS programme funding; and

- The proposed NZTA risk mitigation approach is designed to minimise the likelihood and impact of these risks.

Proposed design and funding confirmation gateway for ARTA

104 Whilst the Thales solution is largely fixed price, there are a small number of elements that are 'time and materials' that are needed to finalise the scope of the implementation with ARTA. This will require a 'user requirements' phase which is part of Thales standard methodology. This seeks to finalise all components of the system implementation prior to the roll-out, and fix the price.

105 The ARTA project plan is currently at a high level as shown earlier, and there are some issues relating to the final shape of the solution still to be resolved. In addition, detailed aspects of the final solution and implementation need to be worked through by ARTA to complete a fully-costed implementation plan. At the end of these processes NZTA propose a 'gateway' to review the overall costing vs funding approved at that time. An indicative date would be 31 March 2010 for completion of both exercises.

106 At the gateway, NZTA would be able to satisfy themselves as to the total cost of the project and adequacy of implementation plans and ARTA ability to execute these plans. If NZTA were not satisfied at that point or at any point in the future, it is possible to require ARTA to exit the contract and make penalty payments to Thales as appropriate. Penalty payments would reflect Thales cost of investment up to that stage (mostly analysis work) and some allowance for loss of profit. These are still to be negotiated and it is in NZTA's interest to keep these as low as possible in case this option has to be exercised.

107 However, this gateway should be seen simply as a precautionary measure to ensure that the project budget does not blow-out once ARTA have completed their detailed planning work for the implementation.

AIFS tender risk

108 Obtaining funding approvals for AIFS has become a long process and this delay has resulted in additional AIFS project costs, and the ongoing risk that highly capable tenderers could withdraw from the process. Now that there is a declared preferred tenderer, and the procurement tender validity expires at the end of September, it is considered to be very high risk if the AIFS is not funded and in contract or near-contract as soon as possible. This includes the possibility of spoiling or vexatious behaviour in the Auckland market. It is thus highly desirable to expedite a decision to minimise further cost and process risks.

Other matters

Financing of the central system

109 The investigation team has considered several options for financing the central system. Given that sufficient funds have been set aside in the NLTP to purchase the central system outright, and that all financing comes at a cost, we have concluded that there is insufficient justification for NZTA to seek finance for this purchase. We recommend that the central system be purchased outright, and that no attempt be made to seek external finance.

Cost recovery of central system

110 While NZTA intends to meet the full purchase costs of the central system (of around $20m), it could seek to recoup a portion of those costs over time through operating charges. However, ARTA has not budgeted for such charges, and is facing significant funding constraints. We therefore recommend that NZTA stipulate that once developed the central system be operated under a cost recovery model, but that no costs will be recovered until after the AIFS is fully operational (i.e. for the first 3 years).

Commercial revenues

111 The investigation team has confirmed that the currently offered Thales central system could be used to provide a limited number of non-transit products and a generic e-purse facility (where the value of the sale is entered by the vendor) without any central system changes, but including some (relatively minor but additional to AIFS cost) requirements definition and configuration. We recommend that this ability to introduce non-transit products be retained, but that the introduction of non-PT transactions be given a low priority until the core scheme has successfully been brought into service.

112 In time, other commercial options are available including;

- Licensing access to transit standards for co-location with banking smartcards; and

- Transaction processing charges for processing and clearing commercial services trips.

Communications plan

113 Detailed communications messages, per the plan below, will be developed to take account of likely stakeholder and media interest in these decisions. This communications material will be tabled at the Board meeting, specifically including material for the Minister. Key messages for the Minister are:

i) a solution justified by direct benefits for Auckland;

ii) value for money and flexibility to meet future change by using an open standards approach;

iii) process and decision achieved through robust commercial process;

iv) thoroughly reviewed and not impacted by recent changes, including PTMA proposals;

v) risks identified and will be robustly managed, and

vi) decision on third party equipment option.

114 Other communication in regard to the AIFS funding/procurement decision will be developed with ARTA, once all approvals and assurances needed by both parties have been satisfied. Communications will be based on the following plan, and will be developed to assist with stakeholder and public announcements in regard to AIFS. This will be kept confidential until Thales has been formally contracted i.e. Late October/early November 2010.

AIFS decision – Stakeholder communications plan

Stakeholder(s)	Messages	Lead responsibility	When/how
Minister and Cabinet	AIFS approval Value for money Auckland transport efficiency Risk management	NZTA Board Chair	Immediate In person and Letter
ARTA – CE and Chair	AIFS approval	NZTA CE	Immediate Phone/letter
ARC – CE and Chair	AIFS approval	ARTA CE	Asap Status briefing
Shortlisted Bidders	Status when contract signed	ARTA	Email/Letter once Thales contract is signed
Media comment	NZTA approach stated when contract signed. No further comment.	NZTA/ARTA	Late October / early November when contract signed. Comment as required
Operators	Status briefing Efficiency opportunity Programme timelines	ARTA	When contract signed. Private briefing before public
Public Announcement	Contract award Efficiency and service improvement Timeline	ARTA	When contract signed. Press release

National Ticketing Programme update

115   Establishment of a National Ticketing Programme is now timely and will provide an appropriately resourced and directed means to deliver a national ticketing approach. This programme would operate in concert with AIFS to avoid duplication of effort and ensure local and national considerations are reflected (or shared) in the key work packages of each programme. The national ticketing programme will follow the same formal programme disciplines proposed for AIFS.

116   The assessment profile for this activity has been determined as being of **High** strategic fit, **High** effectiveness, and **Medium** efficiency.

117   The Board considers that, for the reasons described in this paper, approving funding for AIFS will assist it to give effect to the GPS and meet the purposes of the objectives of the LTMA.

118   We confirm that the matters in sections 20(2) and 20(5) of the LTMA have been satisfied and that the matters in section 20(3) have been taken into account.

In Committee status

119   Board paper 09/10/0269 is in-Committee to allow the Board free and frank discussion of the issues. We recommend it be taken out of Committee when the contract for the implementation of an integrated ticketing system has been awarded by ARTA.

Attachments

120   There are two attachment(s) to this paper

Attachment One: Thales central system re-usability – key points in investigation; and

Attachment Two: Thales central solution – Options for a national approach

Thales central system re-usability - key points in investigation

The NZTA's interest in the Thales central system is in how capable it is to be re-used as the basis for further regional implementations. Thus the NZTA team has focussed on questioning Thales on its functionality and architecture in key areas, which would be able to inform the team on this core capability. This process would be made much easier by seeing a working system, or even a database schema, however in the absence of such hard evidence, an experienced team can conclude much by reviewing the major functional processes that must be followed to use the system.

Thales provided a comprehensive set of documentation on how the system works as part of their AIFS bid. In addition the NZTA team worked through the detailed presentations and Thales workshops with ARTA over a number of weeks to gain a good understanding of what was on offer. At the end of that process there were a number of outstanding concerns from the NZTA team on the reusability of the system (which is naturally not an ARTA requirement). Specific workshops were then organised with Thales to support NZTA's needs.

The major area of concern, on the basis of low-cost re-usability, was to ensure little or no actual software changes would be required to introduce a new region. Secondarily, the degree of dependency of the devices on parameter change from the central system was important - ie what were the 'boundary conditions' which might force a software change in a card reading device or the central system, and what can be done now to preserve our options long term.

In order to draw out Thales on the issue, 28 formal questions were submitted for their written response. (see appendix). These were also reviewed in detail with them in a 3 day workshop. Some examples of the major question areas were as follow:

1. **Describe in detail the process of setting up a new fare product in an established system and how that is ultimately distributed to the card readers. Define a continuum of the relative complexity of Products and identify the CS capability to support it without requiring coding changes. Particularly important is the impact on the readers, ie at what point would they need reprogramming or simply receive new data tables.**

Fare products and the underlying topology of the zones or routes within a region were seen as the major area in establishing the true extent of the configurability of the central system. Thales demonstrated the parameters and the process for setting up new products, which while fully parameterised, do require an expert user to pull the various parameters together on a screen to achieve the goal. Using the Auckland fares policy as a base, Thales also assured that this was well within the parameter constraints of the system and would not require any system changes or device recoding.

The team adopted a working assumption that other NZ regions would be unlikely to have more fare structures outside of the comprehensive parameters available, but that a simple rationalisation programme if required would ensure minimum cost of change.

2. **Discuss how (or if) 3rd party cards could be accommodated, long term. Give primary constraints required that would allow this interoperability. If 3rd party card also had its own readers, assume that Thales card is fully readable on its readers. What are implications re data architecture, capacity etc. Discuss management of this scenario from overall systems perspective.**

This covers a wide-ranging investigation that has been made by the team, not just with Thales, to understand the practical issues and cost implications of 3rd party cards/readers and schemes being accommodated in parallel with the Thales solution. This is documented in some depth elsewhere, but the thrust of the matter is that NZ would need to adopt a set of national standards, which would be based largely on the standards that Thales follow (these are all mature international ticketing standards). The major interest in this context was the possibility of using the Thales central solution to host non-Thales schemes in other regions, and to gain an understanding of what issues that would give rise to. This is a viable approach, technically, but requires other schemes to fully comply with the established standards.

3. **If there is a scenario where ARTA have an implemented Product set, and we seek to implement a new region with a different product set under the one overall system using the same type of readers, what would be the implications to how the central system is managed?**

This was seeking to draw out long term architectural issues and how best we could migrate from an ARTA implementation to a multi-regional one. This proved very useful as it identified what changes (minor) we would have to incorporate within the ARTA implementation to preserve our long term regional implementation options. It also emphasised the relative advantages and disadvantages of a true national system architecture compared to a regional 'clone' concept. This is documented separately.

4. **What is the basis for software change in future – ie what type of change will require coding changes? What changes are simply performed by authorised users through the user interface? What is the relationship between central system changes and changes to the readers? Are there scenarios where a parameterised change in the CS results in a coding change in the readers? Give scenarios. What expertise in the system will be NZ resident long term?**

This question was a more general variant on the product set-up questions, seeking to draw out the extent of configurability and thus flexibility of the system, but particularly on our degree of dependency on Thales to provide the expert user support. A further concern was, if software enhancement is required, where is the knowledge held. While confirming the general flexibility of the system it also highlighted the ongoing complete dependency on Thales to manage the central system and any other regional implementations. It is evident that Thales were relativity content to grant a national licence to this system as they could still make good money on operational support and minor enhancements for 10 years at least, and each regional roll-out would generate fresh income, albeit a lot less than the original. They have taken a 'long view', which is reassuring from a systems implementation point of view, as they aren't simply 'dumping and running'.

5. **What is the scalability of this Central System architecture? What is the basis for this proposal -transactions? Where is the next 'level'? What would be the proposed architecture for half the volume of transactions, what would be the architecture for double? (if appropriate, half /double all relevant sizing parameters)**

This question was seeking to baseline the capacity of the initial hardware, to gauge where future costs may be incurred by bringing on different regions. As a by-product it verified the capacity of what had been proposed. It would also go to the case for whether a national system was an integrated environment with regional 'views' or simply regional re-implementations of the central system, fully dedicated to each region. Each approach has different architecture profiles and disaster recovery issues. Thales has indicated that the usage of the central system could double without any need to increase hardware.

6. **If the Thales bid is based upon taking existing European implementations and then customising them, what is the relative status between these systems? Is ARTA's solution then immediately a new standalone or are there any shared enhancement paths with existing solutions such as obtained with a standard package**

This question was seeking to understand how much of a true 'package' the central system was. If the original package gets improved, do we automatically reap the benefits with an upgrade. This area revealed a slight weakness in Thales business model, as their approach hasn't matured to a pure 'package' level yet. Any improvements made to the 'master' system that the ARTA solution is based on will not be shared, unless we pay for it. This was also reflected in their approach to 3rd party software within their solution. For example, the central solution uses SQL Server 2005 as its database. This is a Microsoft product. We posed the question as to what will happen in 10 years when Microsoft no longer support SQL Server 2005. Will we have smooth upgrade path to new versions. Their perspective is once again that this is a client's responsibility, ie we would have to pay for the upgrade when we deemed it necessary.

Summary

The Thales investigation was based on driving out potential costs of re-using the central system, and quickly establishing a qualitative assessment of such costs. The premise being that its value as an asset to NZTA was largely dependent on the likely cost of re-using it. The major areas of potential cost exposures were therefore:

- Did it need redevelopment, or simple reconfiguring;

- Was its architectural 'footprint' excessive – ie more expensive than possible equivalent systems that could be deployed. Did a new region bring unacceptable marginal costs;

- Did it have a clear upgrade path;

- Can it handle different regional requirements without software change; and

- Was its functionality fit for purpose and complete.

The conclusion was that the Thales offering was a mature, relational system, fully configurable in the key areas necessary to introduce new regions, with rich functionality. It was fully scalable with a clear scaling route based on transaction throughput. Thales estimated approximately $0.5M to implement a new region. As a by-product of the investigation, it is worth commenting that the Thales team impressed with a thoroughly professional and open approach.

Thales central solution – Options for a national approach

The Thales central application proposed for AIFS can be re-used as the core ticketing solution for other New Zealand regions. This is no different in principle to exactly how Thales are implementing the central solution in Auckland in the first place – they will select an existing implementation in Europe and clone it as the starting point.

Discussions with Thales have satisfied concerns over the extent of *configurability* of a re-used central system in New Zealand. ie the system should not require actual software development to re-implement, as long as some reasonable boundary conditions are not crossed in terms of each new regions requirements. This re-assures us that the marginal costs of re-usability will be low in comparison with the AIFS original costs.

Thales has indicated approximately $0.5m to implement a new region. This compares favourably with creating new regional central solutions from scratch. The core Central system components are shown on the following page:

9(2)(b)(ii)

Addendum – additional paragraph to be considered in conjunction with Board Paper 09/10/269 – Auckland Integrated Fares System Update

Assessment

82 We have assessed the project using the NZ Transport Agency's funding allocation process and have determined the following assessment profile:

Readiness for funding this phase	**Ready** • the project is programmed in the 2009–12 NLTP and has been consulted on through the Auckland RLTP.
Strategic fit	**High** • there is potential for significant improvement in growing peak time public transport patronage to address issues of severe congestion in the Auckland urban area; and • the AIFS project has potential to optimise public transport services and infrastructure in the Auckland region by rationalising fare structures, streamlining inter–modal transfers and reducing boarding times.
Effectiveness of the solution	**High** • AIFS meets all low and medium effectiveness criteria – it contributes to LTMA objectives, predominantly economic development and sustainability, and is considered to be significantly effective in achieving the potential under strategic fit; • the project will also contribute positively to the National Energy Efficiency and Conservation Strategy by encouraging the use of more fuel efficient public transport and reducing potential congestion • it will improve integration amongst modes and will enhance operation of public transport networks; • it will contribute to the Auckland Region's planned land use objectives of intensifying urban growth around key transport nodes and along transport corridors; and • the project is an important part of an optimised transport solution for the Auckland Region
Efficiency of the solution	**Medium** • the BCR for the AIFS project would be denoted as 99, based on NZTA economic evaluation procedures, as the do minimum costs exceed the project costs • further sensitivity analysis has been undertaken by considering the ratio of project benefits to project costs (ignoring the do minimum) – this conservative approach provides a ratio of 1.85, suggesting a reasonably robust project • a peer review has been undertaken, which supports ARTA's economic evaluation and risk assessment • further sensitivity analysis has been undertaken which indicates that the project's economic efficiency is quite robust across a range of possible scenarios • while the denoted BCR of 99 usually would provide a rating of High economic efficiency, we are recommending a more conservative rating of Medium given that there is a substantial

| | element of risk as covered in later sections of this paper |
| | • at the same time, we note that its would take a considerable increase in cost combined with a much lower level of patronage than assumed for the BCR to fall below 1 |

Reasons for recommendation

83   The assessment profile for this activity has been determined as being of low seriousness and urgency, low effectiveness and low efficiency.

84   The project contributes to the NZTA's Investment and Revenue Strategy which intends to give effect to the GPS. It contributes to the purpose and objectives of the LTMA, in particular integration, economic development and sustainability.

85   We confirm that the matters in sections 20(2) and 20(5) of the LTMA have been satisfied, and that the matters in section 20(3) have been taken into account.