Smartcards & ITSO™

An Introduction for Bus and Coach Operators

January 2007

Smartcards and ITSO.
An Introduction for Bus and Coach Operators

For those used to travelling on public transport systems abroad, smart cards are nothing new; they are accepted from Europe to the Far East, from South America to North America. Their introduction and use in regulated state owned public transport companies, while not without technical problems, has not been delayed by the questions of funding or affordability, which have to be addressed by the commercialised operators within the UK.

With help from central and local government and changes in the commercial environment, the introduction of wide ranging smartcard schemes is now a viable proposition hindered only by the lack of a champion. ITSO has set out to successfully fill that gap and the attached guidance is a welcome addition to the drive to help introduce the benefits of smartcard technology nationally. CPT, representing the operating industry, welcomes the initiative and believes that by providing common points of reference it sets the agenda for future growth.

Brian Nimick
Director General,
Confederation of Passenger Transport (UK)

SMARTCARDS IN GENERAL

Smartcards have been around for some time but it is only now that they are beginning to be used seriously in UK transport applications (e.g. Oyster in London). This is probably because the business case for the cards – whether they be transport cards or Citizen cards - is being kick-started by Local or National Government funding. Until now, smartcard schemes have been considered expensive for stand-alone transport applications. But the economics change, particularly if the card itself is shared (multi-application cards) and the cost of the smartcard infrastructure is potentially funded by third parties.

The benefits which can be derived from smartcards include:

- Better data for apportionment and reimbursement of concessionary schemes
- Better data about customers and their travel habits[1]
- Automated validation of the ticket, which opens the way to offer more sophisticated ticket types
- Protection against fraud, such as forgery or pass backs
- The potential for electronic money to reduce theft and operational costs and make the cards themselves more attractive to their holders
- The reduction of ticket purchase queues and journey times through faster access.

However, to-date smartcard schemes have not been commercially viable – the business case at best was poor. It is now possible to share the card (and the infrastructure) between a number of applications, such as concessionary travel, library and leisure applications, on a multi-application smartcard. This improves the business case, and major funding of concessionary travel schemes by the DfT has also 'kick started' the growth in schemes that is now happening.
Public transport is adopting modern technology to make life easier for its customers.

The smartcard and ITSO world is littered with jargon.
Appendix C explains some of the most common terms and abbreviations you will meet.

[1] Even where alighting is not monitored, the near 100% boarding sample enables more accurate assessment of travel patterns, particularly if trip pairing is introduced.

BASICS OF A SMARTCARD SCHEME

There are a number of basic elements of any smartcard scheme. In general terms we can describe four elements:

- Tickets (or products in smartcard language)
- Smartcards
- Ticket machines
- Back offices

Tickets

Tickets are an authority to travel and are invariably also a receipt for a fare paid.

In a smartcard system these are represented by a set of data fields, which define the journey or the customer, any restrictions, and possibly also any reservations, meal vouchers etc. They represent electronically what is printed on a paper ticket now. When a passenger presents a ticket, which is loaded on a smartcard, to an on-board reader, the system automatically asks "Is it valid here and now?" and beeps or "burps" accordingly. This relieves the driver of the need to make an instant validity check, which gives the driver more time to check other aspects of validity.

With the processing power in the card chip (the smart bit) and the equivalent intelligence in the ticket machine it becomes possible to offer new types of ticket to the market, such as a seven-day ticket, for example, where the customer selects his days as he travels over the next fortnight.

But tickets do not have to be solely used to authorise a transport journey: they can also permit access to events, or to record an entitlement to something, – all of which can be marketed with the transport application.

Smartcards

Smartcards are usually credit card sized plastic cards with a computer chip embedded in them. It is this chip that makes them "smart" but *how smart* varies with the processing power of the chip. This smartcard processing power can be described in three general sizes – small, medium and large, – and with these come some difference in their attributes:

Card Type	Advantages	Disadvantages	ITSO TYP	TRADE NAMES	Indicative cost each
Contactless Memory Card	• Low cost • Easier to implement • Greater opportunity to recover cost of issue than larger cards – migration to deluxe card	• Not secure • Small memory - single application • Possibly lower value for money compared with other cards • Not future proof • Short Life	4 or 5	Mifare Ultralite or Innovision	30p
Contactless Secure Memory Card	• Room for more than one application • Moderate cost • Sufficient security • Good value for money • Long Life	• No migration to deluxe card option • Medium level of future proofing	7 or 8	DESFire	60p
Contactless Microprocessor Card	• High security - only option for proof of ID applications • Better support for multi-application • Current state of the art • Long Life	• Becoming the cost effective solution for citizen/multi-application type cards • Still little practical experience around	2	JCOPS 30 or 41 Ecebs Multifile or Calypso	£1.10

You will note that the table refers to contactless cards: these are cards that do not have to be inserted into a slot but rather are placed in the vicinity of a reader. They work using an aerial built into the card and connected to the chip. The instructions to customers are usually to touch the card to the reader and then move on. It is widely agreed that contactless cards are essential for transport applications because they are quicker and easier to operate than contact cards.

Contact cards which must be put into a slot are favoured by the banking industry and by those where speed of transaction is not of the essence. Contact cards are too slow when trying to move people through access points quickly: bus boarding, tube gate or Football turnstile.

The market is developing dual interface cards: these have both contact and contactless interfaces, which service the same chip. This would satisfy all markets, but because the technology is more complex, prices are still relatively high. Therefore, it will be some time before we see many of these used in the marketplace.

Contactless cards score highly in regards to card appearance, as there is no visible chip or magnetic stripe to work around. However, the cards need to display the card number and the law also requires a help line contact number to be displayed on the card.

Strictly speaking, we should be referring to the cards as to *Customer Media* (which is the international standards' wording), because latest technology developments allow to present the (smart) chip incorporated into other forms: key fobs, rings, watches and mobile phones.

Ticket machines

The external appearance of a ticket machine will have only one change – the addition of a smart reader with a target area for the customer to touch. Internally there will be extra software to handle the smartcards (equivalent to the printer drivers on your PC) and to handle different transaction formats. However, the fact that the reading mechanism is contactless means, that, compared to contact, there is no mechanical wear with minimal maintenance costs.

Back Office

Back offices come in two parts: the depot equipment and the head office processor. Essentially the functionality of both of these remains largely as it is today:

- Message processing – handles data in both directions, i.e. collects transactions but also sends data to the readers at the ticket machine (in smartcard speak the 'Point of Sale Terminalo - POST).
- Is able to account for what was received and sent, i.e. an audit trail.
- Sorts data between recipients, i.e. needs to know where to send it, and to send it securely. ITSO uses Operator Identities (OIDs) for this task.
- Settlement where appropriate (i.e. authority to transfer funds to third parties).

Smartcards add two additional functions:

- Hot list and action list management: messages which perform an action on the card (e.g. blocking a stolen card or adding a prepaid ticket).
- Account and product management: a history of what has happened to the card and the tickets on it.

If you plan to run a stand-alone smartcard scheme, which you will never extend, to incorporate anyone else's tickets or cards, you can purchase an off-the-shelf package and don't need to worry about Interoperability or ITSO either. So before we go any further it is worth examining what "interoperability" and ITSO mean.

INTEROPERABILITY

Interoperability can mean:

- the acceptance of media (*card* in common language) on different modes of travel, for example, *bus* and *ferry* within one locality;
- the acceptance of the card between localities or distinct geographical locations, for example, *Manchester* and *London*;
- the products (tickets or e purse type products) can be used interoperably between different operators in either the same or different locations, for example, *Virgin Rail* and *First Group Bus*.

Each of above definitions of Interoperability can only exist if all the players agree to purchase their systems from the same supplier or use an agreed set of interfaces. ITSO provides that set of interfaces by way of the ITSO Specification.

ITSO

ITSO is a not-for-profit organisation, which evolved from an initiative in 1998 by the major players in the transport industry, including the Bus Groups, Transport for London, the Passenger Transport Executives, some of the larger Local Authorities, the train operating companies through the Department for Transport, ATOC, Industry Suppliers.

The primary focus of ITSO was the creation of a specification for interoperable smartcards for transport applications. that the ITSO Specification was originally published at version 2.1 in March 2004 and now rests at version 2.1.1 that was published in October 2006 and is Crown Copyright, so is available to all.

The Specification:

- supports a wide range of smart media, whereas other specifications usually support only one. In ITSO the choice ranges from low cost disposable cards to top-of-the-range microprocessor cards.
  The Specification recognises current popular contactless smartcards, such as Mifare 1K &4K and Calypso (popular in Europe). But all are interoperable, giving schemes the most appropriate choice for their application: low cost for single journeys, higher specification for concessionary travel, which may also reside on citizen cards.
- covers all aspects of the transport application and so specifies card data, card formats, point of service activities, transaction formats and back office processing, providing a complete end to end specification for interoperable smart media. Please note that this is not a specification of the products and their commercial attributes, but their electronic specification at each interface – so that they can be properly recognised and processed by all system components.
- defines the security architecture for both, the card and back office transactions providing an end to end security environment, necessary for interoperable schemes. This includes the architecture for the authority levels of operators' points of service.

What ITSO does

ITSO Ltd. now also provides the environment to enable schemes to implement the ITSO specification:

- Certification and Testing (often referred to as accreditation)
- An ISAM (ITSO Secure Application Module)
- An ISMS (ITSO Security Management Service
- A set of 'club' rules
- Maintains the ITSO specification on behalf of DfT and ITSO members.

Certification

Through ITSO contractor Integri, any card, point of service or back office must be certified for compliance with the ITSO specification, before it can be called ITSO compliant. Additionally, that same piece of equipment or software must be verified as interoperable in the ITSO warehouse containing all examples of ITSO certified items , also run by Integri, before it can gain a full compliance certificate.

ITSO makes available its test tools and scripts to suppliers for pre-certification submission testing in their own workshops and in due course may also provide an audited self-certification methodology.

ITSO Members need to be satisfied that any system component they purchase will work effectively alongside any other. ITSO Compliance provides that reassurance. *Compatibility* is a term that ITSO does not recognise.

The ISAM

This integrated circuit card, which must reside in any ITSO based point of service or back office, provides the cornerstone of the security architecture. Developed by ECEBS, it provides key management, data integrity, point of service permissions, authentication, validation, and a massive 4Mbyte of storage for transactions.

The ISMS

Provided by the Royal Bank of Scotland for ITSO, this high security service generates and distributes the security keys and keyfiles associated with smart media and individual products. Interoperability is enabled at this level by the sharing of keys by key owner permission.

This is a crucial component of the ITSO package, since it is the Licenced Member's instructions to RBS which can "switch" cards and products on and off, thereby enabling management of system security on a day-to-day basis.

The ITSO 'Club'

ITSO provides a framework for use of the specification and the environment by means of Operating Licenses and Supplier Registration. These do not however interfere in any commercial arrangements between schemes and operators.

ITSO also has a Suppliers Group, the ITSO Integration Forum (I2F) group, and supports AILO (the Association of ITSO Licensed Operators), – all of which are aimed at supporting those who wish to implement an ITSO based operation.

What ITSO adds to smartcards

ITSO provides the flexibility for schemes to develop as markets unfold. It enables multi application schemes to be developed incrementally, without being tied to one supplier for all system components**.**

ITSO provides an extremely high level of security for end to end data transfer, which is, on a par with the banking sector, essential when you may wish to put an annual season ticket or long term direct debit ticket onto a smart card.

Uniquely ITSO also provides through the scope of the specification:

- *Upgradeability* – the ability to easily enhance existing schemes, whether this be a new ticket type, a different card type for a special event or new bus equipment.
- *Interchangeability* – the ability to replace elements of a scheme with products from a different supplier that will meet the same specification interfaces.
- *Interoperability* – the ability to implement the interoperability of media (cards), points of service, back offices.

It is, perhaps, worthwhile at this stage to discuss Interoperability a little further.

Media Interoperability
There is one fundamental requirement for Interoperability in the ITSO Environment. This is that an ITSO Customer Media (or Smart Card) is capable of being used anytime, anyplace, anywhere. These cover the first two of the previously given definitions.

This means that any card may be used to load products (typically tickets) at any participating product loading point, provided, of course, that there is a commercial agreement in place between a retailer and a product owner, that a customer can purchase a particular product at that location.

Product interoperability
Although ITSO has no involvement in this activity, the specification has been designed to enable operators, product owners and retailers to easily implement the commercial agreements they have come to.

Clearly, some standardisation of trading practices and some common procedures will be desirable, which is why AILO have developed various Codes of Practice. Eventually, Members may wish to see some of these mandated. If, in due course, that proves to be case, then if its Members agree, ITSO will embody them in its Operating Licenses.

Summary. In simple terms:

- Customer media may be used anywhere to load product[2].
- Products are usable only where they are accepted under a commercial agreement.
- Interoperability does not mean that all products are sold or accepted everywhere.

A simple example of such an interoperable application would be a national concessionary travel scheme, such as proposed for England and is already being implemented in Scotland where all the players have agreed to a common interface specification – ITSO. Equally important though is the fact that data within the scheme needs to be transferred from source to owner, which may mean passing that data through a number of participants securely, confidentially and completely.

ITSO has provided the Industry Standard for interoperability and data security in the form of the ITSO Specification.

- [2] But only the products permitted to be sold at that location.

ITSO Brand

What the ITSO brand means is something that is developing as ITSO itself develops. However, to give you some flavour of the debate, the following is an extract of an ITSO Board discussion paper, with respect to the customer facing aspects of the ITSO brand:

- *Customers may be exposed to the ITSO brand where compliance has been confirmed:*
  - *on cards,*
  - *at product retailer's premises,*
  - *at point of sale terminals (in retailers' premises, including on buses),*
  - *at point of acceptance terminals (including on buses and rail barrier lines),*
  - *in product owners publicity,*
  - *in card issuers publicity,*
  - *on websites.*

- *The message must be clear and unambiguous. It must be wholly compatible with ITSO's definition of interoperability. This means:*
  - *On compliant cards, which are capable of carrying more than one ITSO product, the ITSO logo should be displayed (on cards which can only accommodate one ITSO product a logo should not appear).*
  - *ITSO product retailers should display the ITSO logo at their premises and at or close to point of sale terminals. This is crucial, as it confirms to the customer that they can purchase a product, which can be loaded onto their (pre-existing) ITSO card.*
  - *There is no need to display an ITSO logo on a point of acceptance terminal. Indeed, it would be less confusing to require that it is not displayed, except where the terminal is also a point of sale terminal.*
  - *Since on buses the point of acceptance terminal is usually the point of sale terminal (but not always – e.g. articulated buses with multiple readers) the above rules should apply.*
  - *However, on rail where the barrier line is separate from the point of sale, the ITSO logo should not appear at the point of acceptance.*

- *The above is not as confusing as it might appear at first sight because:*
  - *The ITSO logo is always subsidiary to the card owner's and the product owner's logos.*
  - *Whilst retailers will not retail all ITSO products, customers are not trying to buy an ITSO – they are seeking to buy a particular product which will be promoted at the point of sale.*
  - *At point of sale terminals the validity of a product can be explained to first time purchasers – with or without accompanying publicity.*
  - *The customer has first to purchase a product before he can use It, – so he approaches a point of acceptance terminal with some prior knowledge of what to expect.*
  - *At unmanned point of acceptance terminals (e.g. barrier lines) the scheme promoter already has clear instructions on where and how to use the smart media. Further ITSO confirmation is unnecessary.*

- *Publicity message to consumers.*
  ITSO wants scheme operators and product owners to promote the customer benefits of ITSO compliant systems – and it wants that message conveyed consistently. This means that we need to mandate some wording, something like:

  - *For card issuers: ' "(The ITSO logo) on your smart card means that you can also make purchases wherever you see (the ITSO logo) and ask for them to be placed on your smartcard." You will then be free to use the ticket or service you have purchased in accordance with its normal terms and conditions'.*

  - *For product owners: ' "Name of product" is an ITSO complaint smartcard application. This means that you can ask any of our authorised issuing points/sales outlets/bus drivers [delete as appropriate] to place your "Name of product" on any smartcard displaying (the ITSO logo)'.*

This excerpt does not as yet look at some issues that will have to be addressed at some point in the future:

- In the multi-application 'sharing' environment, applications could be added to a card sometime after the card was issued because the card owner becomes entitled to a service. As the ITSO brand will not be on the card, then how are the brand and its implications communicated to the customer?
- The implications of an electronic purse.
- The possibility of the customer owning the card.

Electronic purses

The ITSO specification provides for an electronic purse known as Stored Travel Rights. In the short term, while there can be private (i.e. scheme specific) purses, there won't be a national e-purse, – but ITSO expects that, in due course, when there are sufficient live ITSO schemes to create, a demand for such a product a national interoperable scheme will emerge. By its very nature this will require FSA regulation and the involvement of one or more players with sufficient financial resources to become the VISA[tm] & Mastercard[tm] of public transport.

Currently there exists a significant purse in use in London – Oyster. TfL would wish to extend the scope of this purse both, geographically and in its usage outside direct transport purchases. There are successful examples of this outside the UK, e.g. Octopus in Hong Kong. Currently TfL are looking for partners in this venture and the outcome of that search will shape the future of electronic purses in the UK.

ITSO and You

ITSO is a members' organisation and welcomes both, new members and the active support of its existing members. For more details please see the ITSO web site – www.itso.org.uk or contact us at:

ITSO office Room 122
Centro House
16 Summer Lane
Birmingham
B19 3SD

T: 0121 233 2598
F: 0121 233 0994

ITSO e-mail addresses: info@itso.org.uk and relations@itso.org.uk

If you are a CPT member, you can direct your smartcard related enquiries to:

John Burch, Operations Executive
Confederation of Passenger Transport (UK)
Imperial House, 15-19 Kingsway
LONDON WC2B 6UN

.

Appendix A Some Examples of the Cost of ITSO Participation[3]

ITSO has published an approved version of its pricing structure. This appendix is intended to give an outline of the additional costs associated with ITSO but using 'real' examples. We have included this both, in Summary and details form.

Summary

Indicative costs for bus operators running a stand-alone commercial scheme

The cost of compliance for a stand-alone commercial scheme is likely to be:

- A one off set up fee of £19,618
- First Year annual fee of £3,803
- Subsequent annual fee of £4,492 per annum (at today's prices)

This is based on a fleet size of 250 buses and 10 point of sale outlets retailing the following migrated products:

- Day Ticket Adult/Child/Conc
- Week Ticket Adult/Child/Conc
- Month Ticket Adult/Child/Conc
- 3 month Ticket Adult/Child/Conc

The above can be dealt with using three "IPE Embodiments", i.e. one Operator ID (OID) with one Product Type (TYP22) for single journeys, a separate Product for Seasons (TYP25) and one for Carnets (TYP 23). The two embodiments are able to differentiate between adult & child, full fare and concessionary, origin/destination & area, and at Fare Changes without the need for different IPE's or new keys.

This is in addition to all other smartcard related costs, such as the cost of card procurement, ETM upgrades and transaction processing.

Indicative costs for bus operators running a commercial scheme on a Local Authority Concessionary Product

The cost of compliance for running a commercial scheme on the back of a Local Authority smartcard product is likely to be:

- A one off set up fee of £2,120
- First year annual fee of £500
- Subsequent annual fee of £924 per annum (at today's prices)

This is based on the same fleet/product assumptions as above and assume that the on-board ETMs and point of sale security modules are registered to and managed by the relevant LA. This is likely to vary by scheme, and an ITSO Membership Fee would be payable, if Group Membership was not already paid (£645 joining fee, £970 Annual) by the bus company.

Note: Exact Costs will vary according to scheme configuration

ENCLOSURES:

- Summary of the pricing regime
- Worked example for a stand alone commercial scheme
- Worked example for a commercial scheme on a LA product

[3] The prices given are valid from 1 April 2006

Understanding Smartcard Terminology and the costs associated with ITSO Smartcard Schemes

What role does ITSO Play?

ITSO is not a clearing house but provides the structure to ensure that transaction data gets securely to its rightful owner. It also sets the specification for the processing of transaction data; how the data is managed after it has got to its rightful owner is of no interest to ITSO.

How is the cost of ITSO compliance calculated?

Based on the following variables:

1. Project Turnover

Projected value of sales from the smartcard products – used to calculate the Operating Licence fee.

2. Operator Identity Number (OIDs)

You need to get a unique identity number to identify your smartcard and smartcard products from other schemes and products. They can only be assigned by ITSO.

The OIDs in this example cover –

- The Shell Owner (the owner of the smart card holding the product)
- Product Owner (the owner of a unique product on the Shell)

If you are running a commercial scheme with only your ticket products on the card, then the Assignment Fee will be £1060. If you have a product on someone else's card then the assignment fee will be £530. If you simply accept other people's smartcards, then the assignment fee will be £212.

Note that annual fees also apply as follows:

- Shell owner £212 (also covers Product and Service Provider functions)
- Product owner £106 (also covers Service Provider functions)
- Service Provider £53

There is a further user defined field that allows a Licensed Operator to identify upto a further 255 different Service Operators, Card Issuers, or Depots within each OID. No charge is made by ITSO for using this field.

3. ITSO Secure Application Modules (ISAM)

This is what sits in all ETMs and point of sale units and provides front-end security. You will need one for every ETM and Point of Sale outlet. Price per unit varies according to volume of total order as follows

	3 volt	**3/5 volt**
Up to 50	£77.25 each	£81.90 each
Over 50 – up to 499	£61.80 each	£65.50 each
over 500+	£51.50 each	£54.60 each

4. IPE (ITSO Product Entities)

This is the number of Embodiments of Ticket Types within the scheme. This example has only two IPE Embodiments covering single and period validity.

5. Number of Frame downloads per year

This is the number of times (per year) you plan to make changes to the keys (changes such as price/validity do not require key changes) on the smartcards. Keys are sent in batches ("Frames") to reduce the cost of updates. ITSO require keys to be changed annually; thus each ISAM will normally receive one download each per year.

6. Number of Asset Managers

The Asset management fee relates to the overall management of the ISAM assets and the security surrounding frame downloads. These costs apply to all stand-alone commercial schemes. Local Authorities, or other Service Providers, may provide the AMS function on behalf of Commercial Schemes, albeit at a charge outside ITSO.

7. Membership fees

You must be a member of ITSO to operate an ITSO Licensed commercial scheme or have a commercial product placed on another organisations card (for example, a Local Authority's concessionary scheme). Membership fees vary by turnover of the organisation involved. Membership can be covered by Group membership and individual operating subsidiaries do not need to be members.

8. Operating Licence fees

You must obtain a licence to operate an ITSO Licensed commercial scheme or have a commercial product placed on another organisations card (For example a Local Authority's concessionary scheme). Fee structure is based on sales volume separately for both Shell & Products as follows:

Up to £2.5m	£500 p.a.
£2.5 to £4.99m	£1,000
£5m+	0.025% of sales

9. ISAM fees
These are covered by the purchase of the ISAM (item 3) and through the ISMS charges (item 12).

ITSO Security Management Service (Covers note 11 to 14)

10. Asset Manager Set up Fee

This is the cost of setting up and managing the ISAM assets. Charged at £800 to set up an AMS and then £159 per year, but can be contracted in from a third party AMS Provider (such as a Local Authority Scheme).

11. Know your Customer Charge

This is a charge for two contacts to be vetted for using the ISMS at £50 per contact.

12. IPE Registration Fee

Covers the registration of the products on the smart card and charged at:

- Set up - £530 per IPE Embodiment
- Annual fee of £106 per product per year

13. Annual ISAM Connection Fee

This is an annual £10.60 fee for connecting ISAMs to the ITSO Security Management Service.

14. Charge for Frame Downloads

This is the charge for making changes to the keys on the smartcard: charged at £0.06 per Frame.

Indicative costs for stand alone commercial schemes

Notes	Model Variables	
1	Projected Smartcard Turnover	£ 1,000,000
2	*Required OIDs*	
	Shell Owners OID)	1
	Product Owners OID)	1
3	Number of ISAMS required	260
	On Bus	250
	Off Bus	10
4	IPEs (no. of products on card)	3
5	Number of Frame downloads per year	1
6	Number of Asset Mgrs (acct holders)	1

	Costs	One off Fees	Annual Operating Fees (1st year)	Annual Operating Fees (2nd year)
7	Membership Fees			
	ITSO Operating Licence (Shell & Product)		£ 1,000	£ 1,000
8	OID Assignment Fee			
	Shell	£1,060		£ 212
	Product			
9	ISAM Fees			
	260 ISAMs	£ 16,068		
	ITSO SMS Fees			
10	Asset Manager set up fees	£ 800		£ 159
11	Know your Customer Charge	£ 100		
12	IPE Registration Fee	£ 1,590		£ 318
13	Annual ISAM Connection Fee		£ 2,756	£ 2,756
14	Charge for Frame Downloads		£ 47	£ 47
	(Changes to Product Profiles - such as price changes)			
	Total	£ 19,618	£ 3,803	£ 4,492

Indicative costs for a commercial scheme on a Local Authority card, where LA owns the ISAMS and is the Asset Manager

Notes	Model Varaibles	
1	Projected Smartcard Turnover	£ 1,000,000
2	*Required OIDs*	
	Shell Owners OID	0
	Product Owners OID	1
3	Number of ISAMS required	0
	On Bus	0
	Off Bus	0
4	IPEs (no. of products on card)	3
5	Number of Frame downloads per year	1
6	Number of Asset Mgrs (acct holders)	0

Costs

		One off Fees	Operating Fees (1st year)	Annual Operating Fees (2nd year)
7	Membership Fees			
	ITSO Operating Licence		£ 500	£ 500
8	OID Assignment Fee			
	Shell			
	Product	£ 530		£ 106
9	ISAM Fees			
	First 50			
	51 to 260			
	ITSO SMS Fees			
10	Asset Manager set up fees			
11	Know your Customer Charge			
12	IPE Registration Fee	£1,590		£ 318
13	Annual ISAM Connection Fee			
14	Charge for Frame Downloads *(Changes to Product Profiles - such as price changes)*			
	Total	£ 2120	£ 500	£ 924

Appendix B The Association Of ITSO Licensed Operators (AILO) and its role

The Association of ITSO Licensed Operators (AILO) was formalised in May 2004. This Association evolved from and replaced the original ITSO User Group, which had been formed in September 2003. The membership is drawn from organisations which are considering transport-related smartcard schemes, as well as those, which are on the way to being scheme owners or are existing scheme owners. As a result, members include representatives of major bus operators and train operating companies as well as local authorities.

The aim of AILO is fivefold:

1. it exists to promote better understanding between members and ITSO;
2. it allows and encourages useful sharing of experience of scheme implementation;
3. it promotes product interoperability;
4. it enables the agreement and production of Codes of Practice and Guides, where needed to complement the formal ITSO documentation,
5. and, finally, where it is in the interests of its members, AILO can use its influence on other bodies or organisations.

AILO already has some 40 members. Much of its work, particularly the direction of work on Codes of Practice and Guides, is delegated to a representative body, the Council, which acts as the executive. Secretarial and technical support is provided to AILO initially under a contract let by the DfT, which has a close interest in the work undertaken by AILO to complement the ITSO Specification. Currently, Smartex hold this contract and Smart Card Solutions provide the technical support under arrangements made by Smartex.

The first work to be commissioned by AILO is a Code of Practice for the management of hotlists. Hotlists are lists of lost, stolen, or otherwise fraudulent smart cards. These lists will be produced to allow scheme operators to identify such cards and to switch them off electronically when they are presented at a terminal. Clearly, when a growing number of interoperable ITSO schemes exist, the size of the accumulating hotlist is also likely to grow. Electronic ticket machines (ETMs), especially portable ones, as used by train conductors, or small machines fitted on buses, have limited data capacity. There is, therefore, a need to prioritise the management and transfer of hotlist data to ensure that the lists themselves are at their most effective when they reach an ETM.

At the same time as the Hotlist work was commissioned, AILO recognised that a Guide showing how to set up a scheme would be a useful tool for prospective scheme owners. As a result, this Guide has been commissioned in parallel with the first Code of Practice. Both pieces of work should be available to AILO members by April 2006. More Codes of Practice and Guides will follow: the Association has already prioritised those which have been initially recognised as necessary.

AILO as a body maintains close links with ITSO and is continually updated on the progress of the ITSO Specification. At the same time, it acts as a sounding board for the problems experienced by existing non-ITSO scheme owners, who are in the process of making their schemes fully compliant with the Specification. The ethos of the group is one of assistance to scheme owners, or prospective scheme owners, especially where the experience of others can avoid repeating earlier mistakes, or show a more effective way to overcome problems.

AILO would welcome membership applications from any bus or train operator, local authority, or group of local authorities, considering the implementation of a transport smartcard scheme. For contact details, membership application forms and more information, log in to www.ailo.org.uk.

Appendix C ITSO jargon explained

AMS - Asset Management System - This system manages the ISAMs within the equipment (e.g. POST/ ETMs) and tracks where equipment is located, so you know where you are sending messages. Therefore there must be tight control on the ETM's connectivity in order that they obtain the keys to enable ISAMs inside to work.

CTA - Charge to Account - This is a product type.
Stored Travel Rights (STR) is the equivalent of a "pay as you go" tariff; Charge to Account (CTA) is the equivalent of your journey being charged to an account with a monthly payable bill.

ISAM (ITSO Security Application Module) - This is the "lock" fitted to each device – ETMs or Back office systems. You can only pass through the "lock", if you have an Encrypted Security Key of the Electronic variety. The ISAM is the physical component of the entire ITSO security system and provides the secure signature to all transactions and messages passed between devices and back offices. It enables the various participants in ITSO to trust each other.

ISMS - ITSO Security Management Service - This is a service provided by Royal Bank of Scotland on behalf of ITSO. It issues or removes the encrypted security keys to users, using an extremely high level of security in line with electronic money in banking. When you consider the average value of an annual travel card can be worth more than £500, ITSO considers the fraud incentive merits the use of this extremely high level of security.

ITSO Certification - Each variant of equipment within the ITSO environment requires ITSO Certification. This is provided by Integri, who are an independent testing house, to test suppliers' equipment in compliance with ITSO standards. This service provides assurance that equipment is capable of working together within the ITSO environment.
An equivalent scenario, widely known within the bus industry, is the "Certificate of Initial Fitness" for a new bus. The manufacturer would test each variant of their product by VOSA/DfT and supply the test certificate to the customer to confirm the equipment meets requirements and regulations.

ITSO Licenced Member – An ITSO member who has signed an Operating Licence

Key - Encrypted Security Message issued by the ISMS; that opens the lock (ISAM) and hence allows the flow of data.

ITSO Operating License - To operate in the ITSO environment you need an Operators License. Different parts of the License will come into play depending upon your role in the ITSO environment. A copy of the Operating License is available on the ITSO website (www.itso.org.uk).

ITSO Media Device – this is the Smart Card. "Customer Media " reflects the fact that various items, for example, mobile phones may soon contain a chip with the same capability of use rather than a card.

ITSO Product Entity (IPE) – Products such as travel tickets, specified in an "ITSO format", which can therefore by placed within the "ITSO Shell" (the ITSO part of the smart card).

OID – Operator Identifier, a unique identifying number provided when an ITSO Licenced Member registers

POST - Point of Service Terminal. This can also be known as a sales or acceptance device. On buses they are often the same piece of equipment, but on rail POSTS may be placed in both, booking offices and at barrier lines.

TYP - one of the individual types of IPEs that can be specified.

ITSO Limited
Room 122, Centro House
16 Summer Lane
Birmingham B19 3SD

T: 0121 233 2598
F: 0121 233 0994

ITSO Ltd.
Registered in England and Wales
No. 4115311