

travelspirit

WHITEPAPER 7

Open Payments Systems for Connected Customer Centric Transport Services in the UK

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Summary

Transport users have long sought to be able to buy transport in one purchase to cover all aspects of their end to end journey. Over the past 50 years there have been many attempts to offer users these services, but most have survived for only a short time or in restricted markets. Technology now offers many new possibilities for more widespread joint ticketing approaches. This paper reviews how opening up payment systems could overcome many of the most important barriers to enable seamless payment for transport across all modes of travel.

Joining up Journeys

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More connected payment systems using new technologies need to be as networked as the transport systems themselves. At their simplest level, payment systems can be aggregated and this could be a starting point in some situations. Charges for parking at a railway station aggregated with the train ticket could offer a more convenient ticket. However, the greater potential for added value lies in linking the services to offer combined benefits greater than the separate parts. This paper does not consider these opportunities in detail but notes that the scope of payment systems must be capable of integration across products and services to be able to capture the potential benefits of linking transport with the wider economy.

New business models are emerging to provide the integrated offers delivering connected mobility, access to destination planning (e.g. for events and workplaces), mobility as a service (designing mobility packages around customer lifestyles), travel agents, travel planners, and others. This paper does not explore these business models in detail but notes that the payment systems must work as seamlessly with car parking, retail purchases and lift sharing as with bus and rail ticketing.

Transport ticketing remains largely closed with each provider offering a different way of paying. This has stifled integration and opportunity. The internet shows how far greater value is achieved when open systems are used when compared with closed technology systems. Open transport payment systems can better:

Meet passengers' needs

Make ticketing simple and easy to use

Attract more customers

Attract more value to transport systems

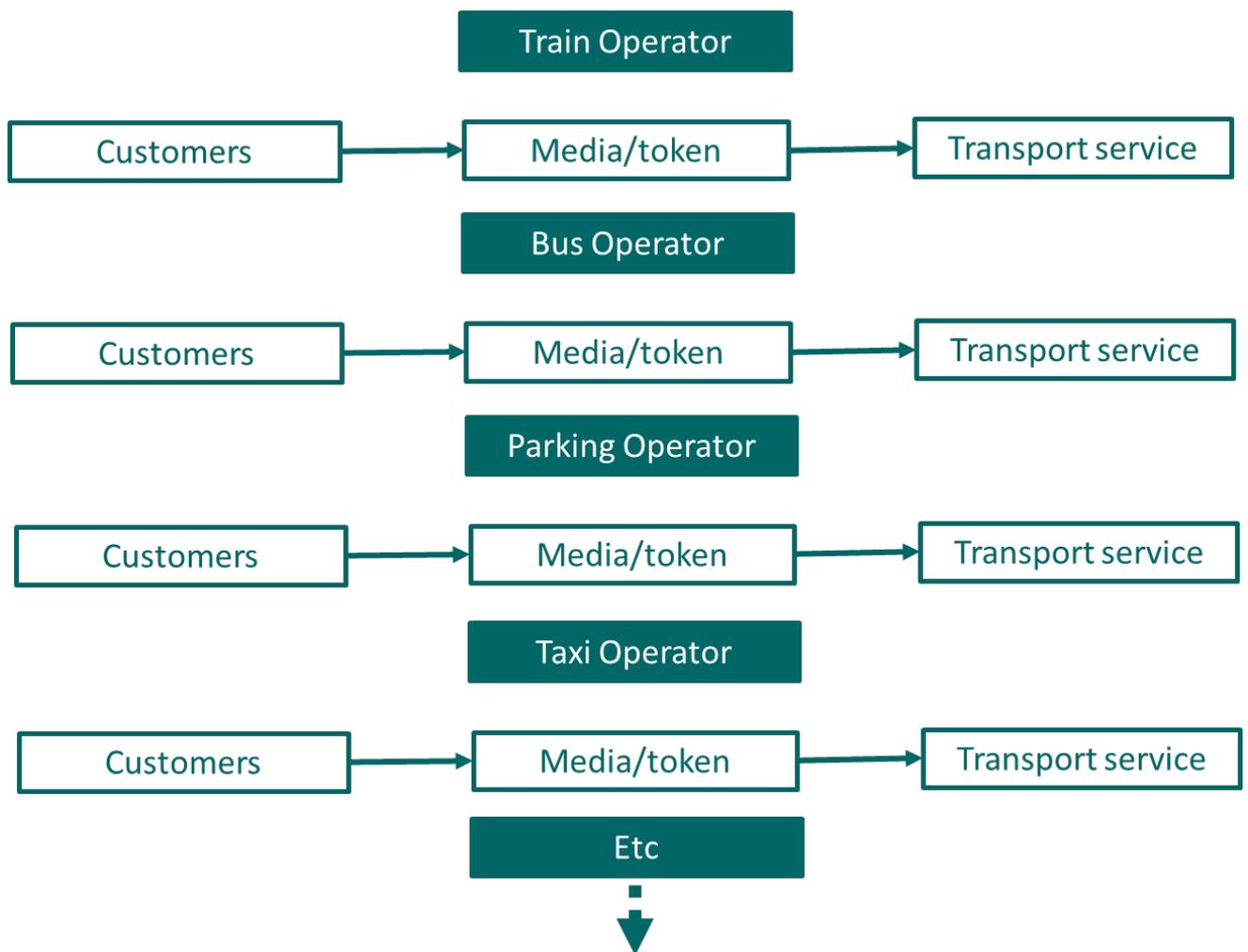
The paper then explains a practical approach to opening-up the thousands of different payment systems operating across transport so that service providers are able to design and retail more joined up approaches in the future.

Adding Value through Joint Ticketing

Buying direct

Most UK transport operators emphasise that 'buying direct' from them ensures the best deal. Virtually all operators offer at least some option for others to retail their tickets but in most cases third party retailers are required to charge more than the direct operator sales.

Figure 2.1 – Separate Payment Schemes for Each Provider



There are many weaknesses with this model. Each individual transport operator can see only part of the travel needs of each customer so has difficulty understanding their travellers, and how to serve them better.

The costs of designing and servicing multi-operator journey offers has often exceeded the price that users have been willing to pay for the convenience so most end to end journey offers have not been sustained. Users want the widest possible network coverage

by area and time of day, the greatest flexibility (if things change during a journey), clear accountability for supply and delivery, and the lowest possible fares. The administration of the ticketing could be reduced to a minimal level using technology but the cost of developing rules for flexibility, accountability and network coverage can be much higher.

To allow users to trade the benefits of lower fares to buy wider network coverage, multi-operator tickets must identify the boundaries, times of day, modes and operators that define a desirable network coverage for the user making the decision. User needs can be difficult to generalise across a large population group so the products and services need to be designed around targeted user groups.

Ticketing and customer accounts

Currently, transport provision is fragmented across many systems and providers, with old fashioned business models (and vested interests in keeping them so). This is inefficient and frustrating for users, and costly for organisations. This landscape makes it difficult for organisations to understand their travellers, and encourage behaviour which is aligned with a range of organisational and individual objectives, including sustainable travel activities.

New technology providers such as connected mobility and MaaS providers must have payment system designs that consider:

- Media used - cash, card, mobile app, token
- Data about purchase and use - ownership of purchase data, where ownership of data is held (e.g. in an account, on a card, by an operator, by a purchaser) and how data is secured (e.g. keys to encrypt or digitally seal data)
- Technology for access control to each mode of travel – e.g. doors, gates, barriers to check tickets
- Payment standards – e.g. Europay MasterCard Visa (EMV), Payment Card Industry Data Security Standard (PCI-DSS)
- Communications standards – e.g. various ISO standards for near-field communications (NFC) access on smartcards for application management, and ISO standards linear and 2D barcodes.

All business processes combine these elements to enable payment for a transport service or services. However current systems are closed through business rules and technologies. Until more open source systems are in place many of the opportunities for MaaS will be frustrated.

Transport involves many low-cost purchases, so one challenge is to keep ticketing costs low enough to enable viable service offers. Pay as you go has been the most widespread approach to keep administrative costs as low as possible.

For small value purchases, value has often been stored on media such as smart cards, paper tickets or equivalent. These cards act as a substitute for cash payments during a journey.

For larger purchases, the entitlement to travel has required greater security so rules are often defined in a back office and a token issued to enable the fulfilment of these conditions. The token carries no intrinsic value other than the details needed to confirm that value has been purchased at the back office. The token can range from a paper ticket to a smart tickets and the ticket substitutes a non-secure data format for a sensitive one.

In order to deliver more complex offers involving some level of integration of transport two main approaches have emerged:

- Where one operator often the seller of the largest proportion of the journey sells related offers. This is common for services such as car hire from airports and adding bus services to rail journeys.
- Where a third party who does not deliver any of the transport services used on the journey packages one or more transport service together, often with other offers such as leisure or retail services.

Both approaches could deliver value by adding customer convenience “as a service” or making more of underutilised resources “as an offer”.

Much the cheapest way to join up journeys is by offering the customer an account to cover all of the purchases they make. The account does not just enable payment but enables the fulfilment of appropriate tokens to gain access to each mode of transport at the point of use.

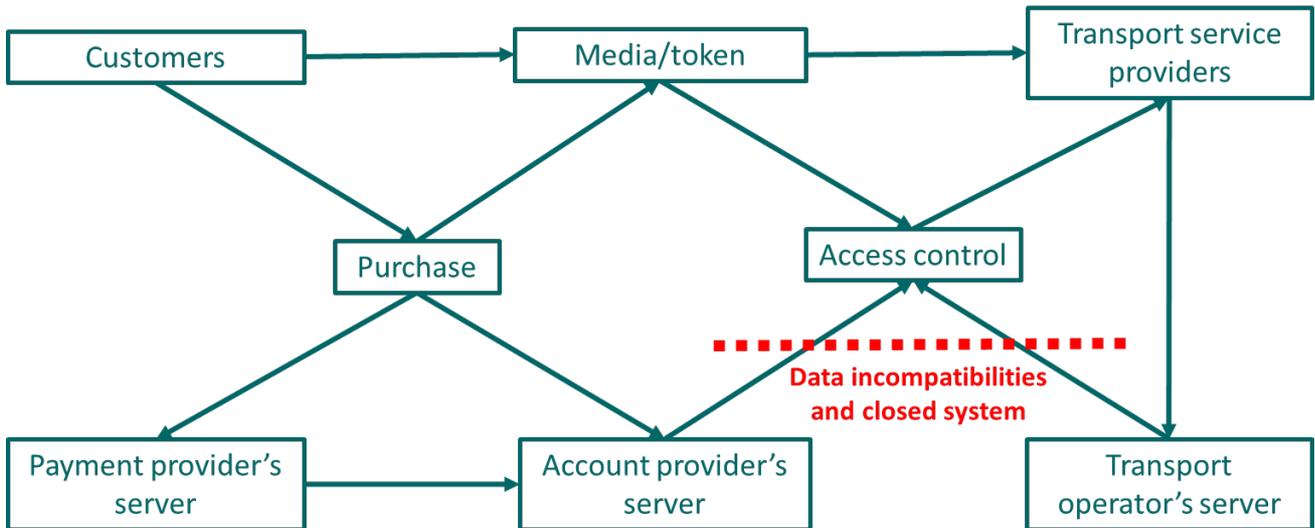
At the point of use, most operators rely on visual validation, electronic connections, or tokens. Most accounts are able to offer some or all of these fulfilment options, in some cases by exchanging vouchers issued by travel agents for tickets/tokens at the point of use, as for many rail tickets.

Towards More Open Systems

From Closed to Open Access

Figure 3.1 shows how payments are authorised either directly or indirectly to enable travel. As new account providers emerge offering new more connected mobility offers closed systems and data/system incompatibility will stifle progress. Some account providers like rail ticket retailers may be able to manage the technical barriers to integration with a single ticket or token enabling access control on several modes of transport (e.g. bus/tram/rail on an ITSO smartcard) but the costs of setting up such integration will be much higher than is commonplace when linking different purchases in other sectors e.g. an online shopping basket for food and clothes.

Figure 1 – Business Models for Payment



Some current business models store value and business rules on the card so the media, purchase, account and access control are merged.

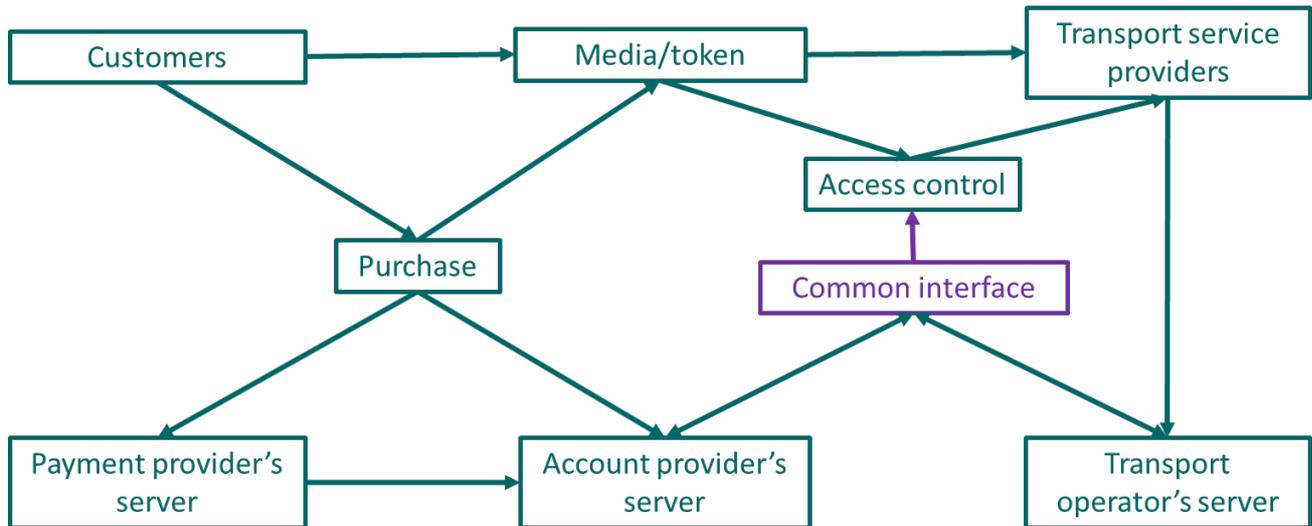
Designing services around users requires a much more customer centric approach to enable the customer to choose the media/token, or even the payment currency, not just for international travel but using distributed ledgers or crypto-currencies to reduce financial administration costs.

Figure 3.2 suggests how a new universal interface between the access control and the accounts could streamline the processes enabling multiple ticket types to be streamed through different accounts. Rather than separate connection formats being needed for each account, standard protocols could simplify the process so allow any combination of account and access control.

An EMV smartcard could act as: media, access control and a payment card or any one of these functions, or an ITSO smartcard deliver media and access control functions, including being topped up by a variety of payment methods. Lower costs access control systems could use printed media such as barcodes, and these are already commonly used for parking tickets and air passenger boarding passes.

This means that cards with EMV functionality can be used to record transport use with the costs charged to the customer being reconciled through their card account. Similarly approaches are possible with mobile devices but an additional advantage of these is that access control can rely on a wider choice of checks (visual, barcode, NFC) all linked back to an account of the customer's choice (mobile phone account, bank account, transport account).

Figure 3.2 – Opening Up Business Models to MaaS Business Models



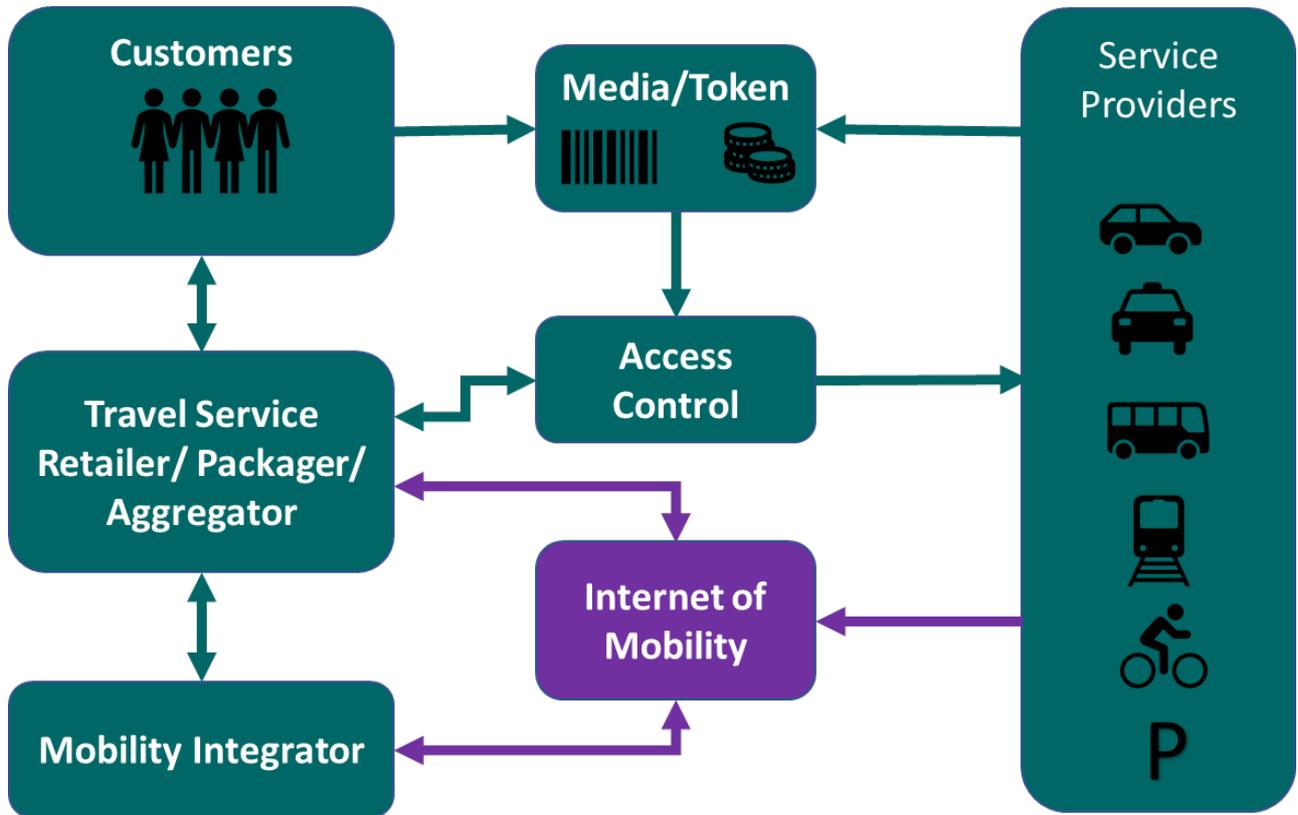
Towards an Internet of Mobility

Account providers (single mode or multi-modal) can share selected data under terms and conditions they post at the internet of mobility. Data protection conditions can be fully enabled by asking customers to customise their account profiles to agree what data they wish to share about their travel and which aspects they wish to remain private.

Transport providers will be able to offer their services on the internet of mobility more easily and cheaply than retailing their own tickets so this could be a strong driver of change.

Figure 3.3 shows how the organisations can be connected by largely existing technologies. Media such as cards and mobile phones are already held by most customers and most transport operators could connect their existing access control systems into the open internet. This would mean that there would be minimal further hardware investment such as ticket machines and ticket gates enabling an early roll out of the open technologies.

Figure 3.3



Next Steps

This is a working paper designed to facilitate discussion within the Travelspirit community.