ENHANCING RURAL PUBLIC TRANSPORT ACCESSABILITY THROUGH IMPLEMENTING A SMART SCAN-ON M-TICKETING SOLUTION:

A UNITED KINGDOM CASE STUDY APPROACH WITHIN RURAL DEREGULATED ENVIRONMENTS

Dr Scott Copsey
Mr John Sykes
Mr Jamie Cecil
Ms Sue Walsh
Dr Richard Southern
Department of Geography,
School of Life and Medical Sciences University of Hertfordshire, UK

Professor Simon Denny
Mr Liam Fassam
University of Northampton, UK

Dr Stephen Joseph
Campaign for Better Transport, UK

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1.0 Introduction – Context

The aim of this paper is to demonstrate how two United Kingdom (UK) Local Authorities (Hertfordshire and Northamptonshire), the two Universities of Hertfordshire and Northampton and a public transport provider (UNO) have worked in partnership to develop a smart scan-on m-ticketing solution, which integrates into a wider 'smart city' solution delivering social good through connected value propositions. Based on the initial success of a Hertfordshire pilot, a specific objective of this work is to establish smart integrated multi-operator/modal solutions. This pilot is subsequently being collaboratively expanded upon, through the UK Department for Transport funded 'Network Northamptonshire Total Transport' initiative, a transformative project to improve connectivity, integration and accessibility for rural transport networks. This forms part of the recently signed 'England's Economic Heartland' tri-county alliance agreement, which aims to work collaboratively across three local authority regions (Buckinghamshire, Oxfordshire and Northamptonshire), consolidating £3bn of spending. This provides a further future platform for innovative transport solutions being rolled out across wider geographical areas.

1.1 Bus Deregulation in the United Kingdom (1985 onwards)

Since 1985, under this de-regulated environment, the bus network was broken up into multiple commercial operations. Local Passenger Transport Authorities (PTAs) provided some limited statutory coordination, mainly acting as a provider of last resort for socially necessary routes that were not deemed commercially viable. This de-regulated approach created variable, inconsistent and un-integrated service provision throughout the UK, with large bus operators dominating regions and cities (CBT 2009; Mackie *et al*, 1995). Effectively operating monopolies, these large companies provided services that suited their own priorities, not those of the public or employers.

The Transport Act 1985 is often quoted (outside of London and Northern Ireland), as the main obstacle to planning integrated and easily understood public transport networks within the UK. Providing smart and multi-operator ticketing (and joint marketing material) were considered, or at least perceived to be anti-competitive behaviour if provided by any operator or local authority. The risk of prosecution by the Office of Fair Trading, under the Competition Act, was threatened if operators were seen to be working together. The Act also reduced the coverage of the bus network through large bus companies acquiring smaller companies, and closing down less profitable routes that were subsidised prior to 1985 (*ibid.*). This has worked against the introduction of joint integrated ticketing products into the marketplace (outside of London). For example, integrated smart ticketing products have been proved to increase the use of public transport, within London and outside of the UK (Sharaby *et al.,* 2012), and is therefore a desirable intervention to pursue. At this time the de-regulated bus industry made such interventions politically challenging, even though technical solutions were possible (CBT, 2009; Docherty & Shaw, 2008).

Missing from all this legislation was the concept of public transport as a network that could compete with the private motor car in terms of cost, convenience and integration. The Office of Fair Trading and the Competition Act (1988) also made this difficult to achieve in practice. The Act effectively prevented multi-operator cross ticketing or co-operation on regular interval or metro style services. This, and the 1985 Transport Act, combined with a lack of ring-fenced funding and co-ordination between different tiers of local government, has led to the decline in bus use outside of London (CBT, 2009).

The decade between 2000 and 2010 witnessed a major leap forward in the promotion of sustainable transport when the Transport Act 2000 (DETR, 2000) was enacted. This Act gave LAs powers to introduce work place parking charges and road user levies, creating a direct impact on business. Under this Act, LAs had a statutory responsibility to develop Local Transport Plan (LTPs) Strategies, many of

which formally incorporated Travel Plans (TPs) into planning obligations (pers. comm., Wilkinson, 2011; DfT, 2002). This amended Act also introduced the concept of the inclusion of Bus Strategies within LTPs which encompassed Quality Contracts (QCs) and Quality Partnerships (QPs) between Local Authorities (LAs) and bus operators, outside of the statutory environment that existed (which still exists within London and Northern Ireland). These partnerships would be encouraged to develop and improve infrastructure and service frequency along public transport corridors by LAs and operators, entering into statutory agreements. However, because of the complexities of the Competition Act (OFT, 1998; Sharaby *et al.*, 2012), (which in terms of public transport was introduced to increase competition between operators and in theory to drive down ticket prices) no QPs and only a handful of QCs were taken forward (Davidson & Knowles, 2006).

Quality Contracts and QPs have been seen as difficult to develop, expensive to set up and likely to generate conflict between operators, while statutory partnerships have been seen to be complex and legalistic. However, Hertfordshire County Council did succeed in creating a unique voluntary partnership for public transport information provision in 1998, encompassing the whole county and all operators. This “INTALINK” partnership has generally proved extremely successful. The University, in partnership with Hertfordshire County Council and other operators in its immediate vicinity, developed another local district based QP (branded Network St Albans), using powers set out in the revised Transport Act (2008) to create QPs, with to goal of developing smart integrated ticketing solutions.

1.2 Total Transport Fund (2015)

In January 2015 the UK Government announced a new £4 million ‘Total Transport’ Pilot Fund from which local authorities in England could bid for resources to implement a cross-sector approach to the delivery of supported public road passenger transport services in their area. Its purpose is to integrate transport services currently commissioned by different central and local government agencies and provided by different operators. The aim allows existing resources to be allocated and co-ordinated more efficiently, resulting in services to passengers that are more effective at meeting their needs. This UK Government initiative matched closely with proposals which had already been agreed by Northamptonshire Council members in December 2014, to develop an integrated transport model to deliver statutory and non-statutory transport services in Northamptonshire through a social enterprise model. The County Council therefore made a bid for the available funding and received £750,000 funding for the two-year period March 2015 to March 2017. This was the largest award made from the fund to any of the 36 projects across the UK.

The Total Transport funding has been used to launch the ‘Network Northamptonshire’ project in June 2015. Led by the County Council, this project is

being undertaken in close liaison with the Universities of Northampton and Hertfordshire, who are providing research and analytical expertise along with the overall project management support.

Key to the project is the identification of synergies which can be achieved by co-ordinating effectively the current disparate efforts of a large number of organisations in the public, voluntary and even private sectors which currently commission and promote the transport of staff, visitors and the public to serve their own needs and the needs of the wider community. Delivering these services more effectively should result in reductions of expenditure, an improvement in service, better 'value for money' and increased usage, or a combination of all or some of these.

While a number of approaches could have been taken, the Network Northamptonshire model involved the creation of a voluntary partnership of all the stakeholders using a memorandum of understanding, originally develop in Hertfordshire, to set out the objectives to be achieved through partnership. Using powers in the Local Transport Act (2008), such a partnership has enabled the County Council to deem it as being 'in the public interest' to identify opportunities for co-ordination and co-operation which might not normally be possible.

It is against this context that this paper presents the case study examples of how a medium sized bus operator actively engaged with and challenged the issues outlined previously in terms of developing its own smart ticketing offer within a Quality Partnership context in Hertfordshire, transferring this knowledge to the Network Northamptonshire Total Transport project.

The initial Hertfordshire demonstrator pilot project explored how a 'smart' m-ticketing platform could provide a sustainable financial business model for implementing ticketing solutions for small and medium bus operators within rural Shires, outside of large urban settings. This unique project was the first scan-on bus mobile ticket product used in the UK (outside of London). It offers a partnership model and governance structure for local authorities, commercial operators and other stakeholders with an interest in integrated sustainable transport to take forward, and leads to the possibility of new, socially innovative models for procuring and delivering transport solutions.

These 'case study' projects have a wider context. Public transport services in rural areas in England are deregulated, and have at present no effective statutory backing or ring-fenced funding. As a result, with recent reductions to funding from local authorities (including in Hertfordshire and Northamptonshire), funding for non-commercial bus services is being sharply reduced and many authorities are proposing to cease all funding for local bus services altogether (Campaign for Better Transport, 2016).

1.3 United Kingdom National Policy Context for Smart and Integrated Ticketing

Currently the new 'Bus Services Bill' is passing through parliament, with the aims of furthering devolved powers to the English Regions, in the form of 'Enhanced Public Transport Partnerships' and to promote smart integrated ticketing solutions. In addition, the bill wants to make 'big bus data' open sourced, like that of London, to help create new innovative solutions for the bus sector.

Promoting sustainable economic growth is a cornerstone of Government policy. Current Department for Transport (DfT) policy is expressed in the Department's 2011 White Paper, Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen, where it is stated that:

> *'public transport needs to be more attractive if it is to be a viable alternative to car travel and key to this is improving the end-to-end journey'.*

Surveys undertaken by Passenger Focus (a UK public transport lobby group) of both users and non-users of passenger transport in general and buses in particular, regularly cite the following barriers with respect to fares and ticketing.

1. Passengers dislike being required to use cash on the bus, and in particular to tender the correct change
2. With stage-based tariffs it is difficult for new and occasional passengers to assess the correct fare before boarding
3. Passengers who have to use more than one route (including changing modes) are often charged higher fares than if a through service was available, and
4. Passengers dislike buying return tickets that may not be used or valid on the return journey.

The Department for Transport Strategy Paper – "Door to Door: A strategy for improving sustainable transport integration" (2013) states that one mechanism to make public transport a more attractive option to car travel is improving ticketing choices and payment options, so that more people can travel with a single transaction across multiple modes of transport. The Department states that

> *'Smart, integrated ticketing is integral to our door-to-door strategy. It can facilitate seamless travel across different modes and operators, making door-to-door journeys by public transport easier'.*

Given their importance to the strategy, the Department usefully defines Smart Ticketing as...

*'**Smart ticketing** is where the ticket or product is stored electronically on a microchip rather than printed on a paper ticket. In most existing smart ticketing schemes, this microchip is embedded in a smartcard, but it could also be on a smart phone. Alternatively, a smart product could be linked to a travel account situated in a scheme's back office, so that the chip acts as a token rather than holding the ticket product itself.*

The above definition could usefully be extended. The principle feature of a 'smart ticketing system' is that of machine readable tickets which can embody complex availability rules through data stored on the ticket, and crucially which can have this data both read and altered by the ticket reading device. Contactless plastic smart cards are currently the dominant medium for smart ticketing around the world but other 'customer media' such as smart phones are gaining ground. The smart ticket can therefore replace cash in some situations, but it should be noted that some payment mechanism is required when loading any form of commercial ticket product onto a card. One current limitation to operators offering tickets through such platforms, are the relatively high transaction costs offered by electronic payment companies through debit and credit card payments platforms. If costs are higher than their cash handling equivalent, bus operators are put off offering smart m-tickets through such platforms. Whilst cash handling costs vary, they are still low enough to allow only higher value tickets to be offered via electronic payment platforms, limiting their potential for transferring substantially smaller cash transactions to electronic tap on transactions, which are proved to assist in reducing boarding times and thus contributing to improved reliability and frequency, as outlined previously.

The legislative framework under which bus services operate in the UK gives rise to a number of anomalies. First, multimodal and multi-leg journeys by public transport are penalised within most current ticketing systems, particularly if more than one operator is involved. Second, services which operate commercially during the day are sometimes not operated commercially at other times and as a result are operated by a different bus operator under some form of contract with the LA. A return ticket purchased in the morning may not be accepted after the evening peak, reducing the incentive for the passenger to choose to travel by bus.

Integrated ticketing provides the freedom for a passenger to choose the most suitable return ticket even if it is known that the passenger will be making the return journey. It can be argued that such outcomes for the passenger represent a failure of the market to operate effectively and efficiently.

1.4 Technological Options Availability

Cashless boarding addresses two of the objectives of smart ticketing, those requiring cash to pay a fare and for such cash to be of the correct value. Cashless boarding benefits bus operators by potentially reducing the time taken for passengers to

board, reducing cash handling by the driver as well as being able to set ticket values that do not require unusual change, which can increase boarding times.

Cashless boarding encompasses pre-paid travel tickets (such as season tickets) and cashless payment. Season tickets are valid for a number of days and most often offer a discount on a week's worth of weekday travel of between 10% to 15% (HCC, 2011), with weekend travel effectively given away at zero charge. However payment must still be made for the season ticket and this is often made in cash to the driver. This results in only a partial reduction in the value of cash handled by the driver in total and potentially leads to delays on particular days (for example, Mondays) when passengers renew their weekly or monthly tickets.

Cashless payment technology is currently limited to bank cards and those devices that emulate them. Such cards are known as EMV (Europay Mastercard Visa). It is currently not possible to accept credit or debit cards (henceforth termed EMV cards) on buses in Hertfordshire. Transport for London (TfL) does now accept EMV cards but this is for payment only and it is believed that the fee paid by TfL to the card acquirer is potentially quite high in comparison to the value of the ticket. This cost would be impossible to absorb by smaller operators, without substantially increasing fares or cutting into already small profit margins.

Alternatively it is possible to use 'travel tokens' stored on a smart card. These travel tokens are denominated in £s and are used to 'pay' for any ticket available from the Electronic Ticket Machine (ETM). Travel tokens must however be loaded onto the card and in the absence of other mechanisms this would be through cash payment to the driver. Cashless payment is therefore most effective when used for off-bus ticket sales. Two main channels are Ticket Vending Machines (TVMs), ticket offices and the internet. TVMs have high capital and revenue costs and are appropriate in high footfall areas such as light and heavy rail, and some busway systems.

Hertfordshire County Council used some of the smart ticketing part of its LSTF allocation to develop a prototype low-cost off-bus mechanism for ticket retailing and fulfilment. The low-cost ITSO-compliant TVM developed by RSL (an IT company), permits the vending of both plastic and disposable smart cards, and adds ITSO Product Entities to ITSO Customer Media. This could then be added to the TVMs based on RSL's current kiosk designs and can be mounted on existing kiosk mounts.

1.4.1 Bar code and print at home tickets

An alternative to specialised fulfilment devices is to present the permit to travel as a two-dimensional bar code image which may be rendered on paper or on devices such as a mobile phone. The ETMs procured by Hertfordshire County Council were ordered with bar code readers and are able to create bar codes, but this does not fulfil the cashless boarding objective. It would be reasonable to require passengers to present the bar code and the EMV card when boarding a bus. Bar codes for use

on buses therefore require a different mechanism for combating fraud such as encrypting the card holders name in the bar code data. A series of keys is used to thwart attempts to reverse-engineer the bar code data.

1.4.2 Charge to Account

An alternative use of machine readable tokens is to enable ex-post payment systems where the identity token is linked to a direct debit facility on a bank account. This enables 'best price' calculations to be carried out as a back office function whilst achieving many of the benefits of smart ticketing. Such systems are best suited to simple fare structures (such as the two-zone system that UNO operates).

The vast majority of transport smart cards in use in the UK today are used for proof of entitlement only. However, entitlement and proof of identity cards offer mechanisms through which transport smart cards could be delivered without the need to introduce additional card management schemes.

There are existing cash free concessionary fares already available within the case study areas. The England National Concessionary Travel Scheme (ENCTS) is a national scheme that enables qualifying individuals to travel for 'free' on off-peak local buses throughout England. County Councils are responsible for administering the ENCTS and Concessionary Travel Payments to Operators. Under the Transport Act 1985 and Section 150 (1) of the Transport Act 2000, the Public Transport Authority has a duty to reimburse operators for revenue foregone, plus any net additional costs for journeys made under the Concessionary Bus Travel Act (2007), as well as for any local enhancements agreed under the Transport Act 1985. This existing cashless platform already provides an electronic footprint, which has been utilised as the field trials develop to compare against cash, concessionary and mobile platforms, in terms of time efficiency gains.

1.4.3 Integration with broader United Kingdom and European Smart Ticketing Strategies

Hertfordshire's ETMs and TVMs allow a progression of ticketing technology from simple barcodes to full smart ticketing that is compliant with the UK government's Smart Ticketing Strategy as well as the European Commission ITS Strategy, and the Directorate - General for Mobility and Transport (DGMOVE) Guidance Document on Smart Ticketing (2013). Both ETMs and TVMs are certified by the Integrated Transport Smartcard Organisation (ITSO Ltd) which manages the UK interoperable smartcard specification on behalf of the UK Government. ITSO is a Founder Member of the Smart Ticketing Alliance (STA) along with the national smartcard bodies for Germany and France, plus the Calypso Network Association. The STA Specifications provide the necessary specifications for multi-application transport smartcards and smartphones capable of holding multiple tickets in a single Smart

Ticket Wallet capable of use in smart ticketing schemes across Europe. The STA, and with it ITSO, are also working closely with the GSMA (the international association of Mobile Network Operators) to specify how smartphones can be enabled to provide journey planning, real-time information and hold the necessary smart tickets for the chosen journey. The Hertfordshire scheme is thus forward compatible for use with any smartcards or smartphones certified by ITSO and the STA.

1.5 Research Rationale, Aim and Objectives

The aim of this paper is to demonstrate how Hertfordshire and Northamptonshire County Council's, the Universities of Hertfordshire and Northampton have worked with the Universities wholly and joint owned bus company (UNO) to develop Smart M-Ticketing solutions for their respective regions. The future aim is to investigate the potential for developing this work into a 'Total Transport', Mobility as a Service (MaaS) solution (DfT 2016), incorporating multi-operator and multi-modal smart solutions across these regions.

The effectiveness of the respective marketing campaigns, technical development aspects and implementation issues are reported. A key objective of the research is to better understand the uptake and potential of the Smart M-Ticketing solution(s) by both current bus users and non-users. In addition the growth of smart ticketing will be examined through the analysis of all electronic ticket sales before and after implementation, to better understand its impact and potential for greater uptake by existing users and ability to grow the market through attracting new users.

A key objective is to provide a detailed financially sustainable business case for implementation by other operators, and also use the findings to developed future integrated strategies for wider development of Smart M-ticketing across a multi-operator bus network, and multi-modal network (bus, train, bike, car club etc.), such as that promoted through the Quality Partnerships in Hertfordshire and the Total Transport Project in Northampton (see Copsey *et al,* 2012 & Fassam, Copsey & Gough 2016).

This research has added importance, because the UK Government is proposing legislation on bus services in England (through the Bus Service Bill) which would confer significant extra powers on local authorities to intervene in the bus market in various ways. These projects may act as pathfinders for the use of these powers in non-metropolitan areas. Structures supporting a partnership approach involving all those with an interest in public transport are a critical part of improving rural connectivity and accessibility. Through the experience of establishing quality partnership models in Hertfordshire, this paper will go on to detail the subsequent work now underway developing a Social Enterprise model involving local government, universities, operators, health and education services in

Northamptonshire, which will form the basis of the transformation of rural integrated sustainable transport delivery.

1.5.1 Research objectives

- To further develop and implement a range of ticket products for UNO that can be deployed on smart mobile phones.
- To examine bus patronage data before and after the introduction of mobile ticketing and suggest possible fare zoning structures, and report its impact on boarding times.
- To describe the technological aspects of smart and integrated ticketing, with specific regard to the barriers and business model opportunities applicable to differing forms of smart m-ticketing.
- To recommend future directions for the development of smart and integrated ticketing in Hertfordshire and Northamptonshire.
- To develop this work into a MaaS Solution in these two locations, and surrounding environs.

2.0 Case Study – UNO Bus

The University established its own bus company in 1992 (rebranded UNO in 2005), making use of the powers set out in the Transport Act (1985). At the time, the incumbent operators were willing to work in partnership with the University, but were deemed too expensive and unable to be inclusive to meet the University's needs (pers. comm., Waters, 2012). One of the key aspects of the University of Hertfordshire's Travel Plan offering is that it provides public transport links to and from the University's campuses across Hertfordshire, which has contributed to reducing employee car use by 15 per cent (between 2003-13). At this time the University was changing from a Technical College, based on the aerospace industry towards more service led training courses, including nursing (UH, 2012 & 2013). The bus network was required to move students between its campuses and local hospitals, where applied training took place. In order to assist this, an existing intercampus service was expanded into what has become a 100 vehicle operation serving Hatfield, North and Central Hertfordshire, South Bedfordshire, North London and most recently Northampton, where a joint venture with the University of Northampton was launched in 2012, operating c.20 vehicles. UNO's network has developed an area-wide travel planning solution, providing services that meet the needs of both the University, other large organisations in the vicinity, but importantly also benefiting the wider community, which currently provides over 60 per cent of all users. This approach has led to a more financially viable and sustainable approach to delivering a bus operation within Hertfordshire, and was deemed a good fit case

study on which to begin to implement a smart mobile ticketing solution, that could be extended to its other operations and to other operators as and when its viability is proved.

3.0 Methodological Approach

Two main elements of the research undertaken to date, include data collection and analysis of existing ticket sales data provided by the on board electronic ticket machines, as well as undertaking a initial online survey to solicit the views of existing and potential new users to m-tickets.

User reactions have been positive, generating large digital data sets, analysis of which indicates rapid user uptake in comparison to other schemes. This data enables detailed analysis such as precise user geo-spatial distribution, supporting targeted marketing and route-specific promotions to encourage further service uptake. A critical success factor of the project was to target a reduction of on-bus cash handling by five per cent within the first 12 months. This would aid in reducing bus loading times, improve reliability and operator efficiencies. After two years of operation, uptake growth in excess of 7 per cent of total revenue has been achieved, on specific routes the transfer to m-ticket has exceeded 12 per cent, with targets of 10 per cent of total cash to mobile conversion predicted by the middle of 2017, likely to be realised. The effectiveness of marketing campaigns, technical development aspects and implementation issues will continue to be monitored and reported.

The objectives to extract relevant transaction data to construct a month-on-month comparison, in order to detect material gains in boarding times from reduced cash handling indicates that there is an eight second benefit per transaction from cash to mobile sales, with resulting improvements to reliability/frequency on the network.

Further spatial selection of data layers are used as a feature within the Geospatial analysis work, in order to analyse individual bus-routes for m-ticketing utilisation by staff & student populations (the target sample), as well as identifying additional areas of interest from wider public use. Peak time analysis is beginning to inform improved bus scheduling, with the view that m-ticketing may allow for operational improvements due to reduced boarding and cash handling times. Further work is currently being developed around how engagement with local businesses, through the operators, with users could offer incentives that encourage greater use of bus services. This would have the double benefit of promoting local economic growth, through a club card style incentive, whilst also promote behaviour change away from single occupancy car use, benefitting both University Travel Plan strategies.

4.0 Preliminary Conclusions and Future Work

This Smart Mobile Ticketing demonstration project aims to provide empirically based insights into both the development and implementation barriers when attempting such smart ticketing schemes within de-regulated environments. Whilst many of the researches objectives relied on the implementation of the Smart ticketing service, development issues have emerged as the work developed. Many issues/obstacles to successful implementation have already had to be overcome through project management by the Steering Group members; including understanding and making a business case based on how transactional costs impact on what ticket types and costs can be offered. This had limited the project to offering tickets with a face value of over £22, but as the project developed and evolved Barclays Pingit (a payment platform provider) appeared on the scene, and offered smaller transactional costs, allowing for tickets just over £10 to be added to the mobile application (App). Discussions with Corethree (the App provider) were also held on whether smaller transactional costs could be provided to the operator, which would allow for tickets under £5 to be offered to customers. This was recently agreed based on the uptake of smart ticketing, and provides the project with further interesting opportunities which will emerge into the future as the project evolves.

Areas that were been identified for further development and research include consumer feedback, bus driver training, as well as additional resource downloading and interpreting the large amount of data that is provided by the INIT electronic ticket machines. A social media feed and smart ticket reporting email has been provided to users, in order to both report and solve issues for quick resolution. Drivers are trained on how the smart tickets are to be correctly scanned, and on their availability. Anecdotal driver feedback indicates that the tickets save boarding time and ensure that drivers can concentrate on keeping services to time. UNO has also appointed a part time data analyst, to use the data for operational and research benefit.

A recent development has seen the project team secure ‘seed’ funding from Hertfordshire County Council, to develop operational and business propositions for the large data provided from this project. The ‘Big Bus Data’ project, will work with UNO, University of Hertfordshire and a business engagement specialist (Supporting Your Business) to look at developing innovative business models for making best use of the ‘Big Data’ gained from on board digital INIT ticketing machines (including real time, digital concessionary ticketing and mobile ticketing).

The project aims include:

1. Using the big digital data analysis currently available, to develop a business engagement program to develop a greater take up of bus services through;

    a) Employees travelling to work (and leisure)

b) Businesses wishing to make use of brand awareness and marketing opportunities to engage with travellers

c) Develop a greater understanding of business innovation/opportunities throughout Hertfordshire (or Herts based businesses)

2. To develop a business engagement model and connect with large organisations with high transport demand and usage (or potential usage).

3. To connect with a range of businesses identified using the data analysis to explore the potential demand for increasing bus use.

The resulting business model developed can then be shared with other operators to enhance the bus network as a whole and therefore has transferability and further role out and research opportunities.

However, it is clear that the smart ticketing project offers wider potential for extending the model to other rural areas outside of London, as well as to larger urban conglomerations, as a way of reducing cash-handling issues for operators, gaining operational efficiencies and increasing the payment options available for bus users, thus increasing the overall attractiveness of bus travel.

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