Institution: Plymouth University

Unit of Assessment: C17 (Geography, Environmental Studies and Archaeology)

Title of case study: ITSO smart ticketing throughout South West England

1. Summary of the impact (indicative maximum 100 words)

A key element of the **Plymouth Centre for Sustainable Transport's (CST)** work since 2007 has been leadership of a major project to introduce and roll out smart card ticketing technology across South West England. Such technology brings significant sustainability benefits, but is extremely difficult to deploy in the UK's deregulated public transport operating environment. Professor ***Jon Shaw*** and Dr *Andrew Seedhouse* created with colleagues South West Smart Applications Ltd (SWSAL), a region-wide public / private not-for-profit company launched by Transport Minister Norman Baker in October 2010. The company is supporting the delivery of new smartcard ticket machines on all registered local buses in the South West. This has delivered significant improvements to public transport service delivery, shaped the roll-out of government transport policy and produced direct stimulus for the development of new public transport ticketing products and practices.

2. Underpinning research (indicative maximum 500 words)

Prof. Shaw's longstanding work on UK transport policy provided the academic stimulus for the creation of SWSAL. Shaw began his academic career as a PhD student at Plymouth (1996-1999) before moving to Aberdeen. He returned to Plymouth in 2006. Following career experience in regional government, Andrew Seedhouse undertook PhD research at Plymouth under Shaw's supervision on critical analysis of Government policy in regard to public transport, accessibility, sustainable tourism and the rural economy, with particular reference to community rail schemes.

In work published in *Area* (Gray, Shaw and Farrington 2006) on the role of mobility in maintaining social capital in rural areas it was highlighted that it might be "effective to provide subsidies direct to the passenger through…a dedicated rural mobility scheme using 'smart card' technology." Subsequent work in collaboration with Glasgow University (Docherty and Shaw 2011) has identified a number of shortcomings in UK transport policy formulation and delivery – including the lack of smartcard use – and suggested ways of addressing these. One area of detailed investigation has been the introduction and effective administration of the Concessionary Fares scheme for older and disabled people across the country (Andrews, Parkhurst, Susilo and Shaw, 2012).

Concessionary Fares are most effectively delivered through smartcard ticketing for both administrative and operational reasons. Moreover, benefits of speed, flexibility, and potential inter-operability of cashless public transport ticketing are easily extendable to all travellers once the system has been established, and significant social, economic and carbon reduction benefits can result (see below). Smartcard technology is used in London and across the developed world as the preferred mechanism for public transport ticketing, but introduction in the UK provinces was hampered by the unique deregulated environment that is designed to promote competition rather than cooperation between pubic transport providers. This means that in practice it is extremely difficult to provide 'inter-operable' tickets, i.e. those which can be used on any bus company. Smartcards offer an easier way of achieving this because passengers' movements can be tracked, allowing bus companies to recover the exact amount of money owing to them, but a complex industry standard operating specification, called ITSO, has had to be adopted to deal with UK transport governance arrangements and to enable multiple ticketing systems to exchange data using defined proccesses.

The insights provided by this academic research and practical experience have underpinned the introduction of smartcard technology in the South West. In 2008 Seedhouse and Shaw established the South West Smartcard Board – a partnership between all 15 Highway Authorities in South West England, the largest 15 Bus Operators and regional stakeholders – to identify research

needs for determining business case parameters for investment in smartcard technology. The resulting research, funded by a successful application for £40,000 to the Regional Improvement and Efficiency Partnership (RIEP), found a positive Benefit Cost Ratio for investment based on realising procurement and operational efficiencies through appropriate shared back-office technology (a so-called HOPS) (Johnson 2009). In July 2009 the **CST** applied for and was awarded a further £80,000 from the Innovation Fund at the South West RIEP for an eight-month research exercise to develop and produce the delivery framework and technical specification for the HOPS. This work was completed in March 2010 (Robinson 2010). Having determined the business case and developed the technical specification to deliver the regional HOPS, Seedhouse and Shaw led the formalisation of the South West Smartcard Board into SWSAL. Two further successful grant applications have resulted in £4.87m of funding being awarded to deliver the case study project.

3. References to the research (indicative maximum of six references)

Andrews, G; Parkhurst, G; Susilo, Y and Shaw, J (2012) The grey escape: investigating older people's use of the free bus pass. *Transportation Planning and Technology* 35, 3-15. International peer-reviewed journal.

Docherty, I and Shaw, J (2011) The transformation of transport policy in Great Britain. The New Realism and New Labour's decade of displacement activity. *Environment and Planning A* 43, 224-251. International peer-reviewed journal. Impact factor 1.89.

Gray, D; Shaw, J and Farrington, J (2006) Community transport, social capital and social exclusion in rural areas. *Area* 38, 89-98. International peer-reviewed journal. Impact Factor 1.685 ISI Journal Citation Reports Ranking, 2012, 19/72 (Geography).

Johnson, P (2009) *South West Appraisal Report of Smartcard Business Case Efficiency Options*, PJA Ltd. Published consultancy report, conveyed to non-academic audience, as commissioned by Seedhouse & Shaw who provided the brief and context. All consultancy work was scrutinised by the Department for Transport

Robinson, I (2010) *AMS HOPS Specification for South West Smartcard Board*. MVA Ltd. Published consultancy report, for specialist technical audience, commissioned by Seedhouse & Shaw who provided the brief and context. All consultancy work was scrutinised by the Department for Transport

4. Details of the impact (indicative maximum 750 words)

The main impact of this project has been the delivery and installation of smartcard ticketing technology across almost the entire bus fleet of the South West of England, with associated social, economic and environmental benefits (see below); at the time of writing, only one company is still to have its equipment upgraded. Although such technology is relatively straightforward to introduce in a regulated, single-authority transport jurisdiction such as London, the deregulated operating environment of the provincial public transport sector in the UK has necessitated the development of a complex back office support system capable of handing over 300 bus companies' commercial data reliably and securely.

Our work constitutes a UK and EU first and is being used by the Department for Transport in support of developing the national agenda as it delivers on its stated aim of introducing smartcard technology throughout England (see section 5). The DfT is clear that "The work that SWSAL is undertaking… is central to the Department for Transport's delivery of smart and integrated ticketing" (Reference 2). Local bus company Western Greyhound, the largest independent bus operator in the South West, agreed: "without the support and research from the university, the investment in this new technology… would have either been delayed or may not have happened" (Reference 4). As of July 2013, over 3000 new ITSO smartcard machines have been installed and the Confederation of Passenger Transport confirmed to us that this has brought benefits "to the local bus sector [of] ca. £2.539m per year," principally from eligibility for an increased level of Bus

Service Operators' Grant (BSOG)(Reference 5).

We identify four further impacts. Firstly, an open access pay-per-use ITSO back office (HOPS) and a card management system (CMS) have been procured through the Official Journal of the European Union (OJEU), and are available to all SWSAL members. These have been operational since August 2011 and already handle over two million journey transactions per week. They also support smartcards for more than one million South West residents (predominantly Concessionary Fare passes), thereby aiding revenue apportionment and the generation of management information. Speaking at the launch of SWSAL, Transport Minister Norman Baker said: "This open access ITSO HOPS is the first system of its kind in Europe, and this is exactly the role I'd like to see [Passenger Transport Executives] and larger transport authorities take… By 2020 I'd like to see seamless travel on one smartcard throughout the country. The South West is certainly playing its part in the delivery of this smart ticketing goal, and in the delivery of efficient and sustainable transport for the future" (Reference 1).

Secondly, England's first regional 'e-money stored value transport ticketing platform' is now being rolled out. This platform enables, for example, a bus user in Cornwall to add £20 to his or her smartcard online, and then use this card on buses across the South West. It is the multi-operator, multi-authority equivalent of the Oyster online top-up scheme in London. The West of England Partnership, who are already operationally live with the platform, note that "it is clear that without the investment made, and the research completed by the university through SWSAL, the South West would not have the UK's first multi-operator platform for ITSO ticketing available for all local authorities and operators to utilise" (Reference 3).

Thirdly, a support fund to enable community transport schemes to adopt smartcard ticketing technology has been established. Funds are being used to help bring smartcard technology to Community Transport Schemes (in partnership with the National Community Transport Association), and a pilot project to introduce smartcards to Community Rail has been set up in partnership with the National Association of Community Rail Partnerships and Network Rail.

Finally, a dedicated impact dissemination package has been provided, where SWSAL is now using the research and subsequent outcomes to assist other English local authorities and bus operators in meeting the government's smart ticketing policy aspirations. The Department for Transport "would… like to highlight how SWSAL have shared their knowledge and have helped DfT and other local transport authorities to define strategic smart requirements. Unquestionably SWSAL involvement has helped push the national smart agenda forward" (Reference 2).

It is estimated that in combination, these benefits will add up to a cumulative net benefit across six core areas (savings in administering Concessionary Fares, efficiencies from the regional HOPS, additional public transport patronage due to ease of use, resulting emissions and congestion reduction, additional Bus Service Operators Group and local economy supply chain impacts) of some £35m by 2015 (table 1).

	Benefit
1. Concessionary Travel Saving	£1,613,764
2. Regional HOPS Efficiency Gain	£1,042,147
3. Additional Patronage Income	£8,937,600
4. Emissions & Congestion Savings	£4,932,337
5. Additional BSOG Income	£9,628,271
6. Local Economy Supply Chain Impact	£9,413,000
total	**£35,567,119**

Table 1. Financial values of four-year benefit (2011-15) from ITSO Smart Ticketing investment and usage, devised using Department for Transport and NATA values and National corroborative research.

5. Sources to corroborate the impact (indicative maximum of 10 references)

1. Speech by Transport Minister Norman Baker at the formal launch of SWSAL on 8 October 2010 in which he confirmed the role of the CST and SWSAL in the delivery of the Department for Transport's smartcard agenda (see quote in para. 4, section 4).
2. Letter from Programme Manager (Smart Ticketing) at Department for Transport (5 December 2012). Confirms the centrality of SWSAL to the DfT's delivery of smart and integrated ticketing.
3. Letter from the Transport Delivery Coordinator at the West of England Partnership (comprised of the four local authorities in the Bristol / Bath urban area: Bath & North East Somerset Council, Bristol City Council, North Somerset Council and South Gloucestershire Council). The correspondence (4 December 2012) highlights the role of SWSAL in developing the HOPS, rolling out the new bus ticket machines and developing the e-purse.
4. Letter from Managing Director of bus operator Western Greyhound (4 December 2012). Commends SWSAL's initiative and suggests that in its absence the roll-out of smartcard ticketing across the south west may not have happened.
5. Letter from the Deputy Director of Operations at Confederation of Passenger Transport (4 December 2012) Notes how SWSAL's work has led to the equipping of over 3,000 buses with new ITSO enabled ticket machines and how nearly £2.6m of additional support has been paid to south west bus operators as a result of BSOG uplift.