

**CiViTAS**  
Cleaner and better transport in cities

**ARCHIMEDES**

AALBORG • BRIGHTON & HOVE • DONOSTIA-SAN SEBASTIÁN • IASI • MONZA • ÚSTÍ NAD LABEM

## Brighton & Hove

### T10.1- Multi Modal Ticketing in Brighton & Hove

Brighton & Hove Bus Company

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THE CIVITAS INITIATIVE  
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# 1. Introduction

## 1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for Clty-VITAlity-Sustainability. With the CIVITAS Initiative, the EC aims to generate a decisive breakthrough by supporting and evaluating the implementation of ambitious integrated sustainable urban transport strategies that should make a real difference for the welfare of the European citizen.

**CIVITAS I** started in early 2002 (within the 5th Framework Research Programme);  
**CIVITAS II** started in early 2005 (within the 6th Framework Research Programme) and  
**CIVITAS PLUS** started in late 2008 (within the 7th Framework Research Programme).

The objective of CIVITAS-Plus is to test and increase the understanding of the frameworks, processes and packaging required to successfully introduce bold, integrated and innovative strategies for clean and sustainable urban transport that address concerns related to energy-efficiency, transport policy and road safety, alternative fuels and the environment.

Within CIVITAS I (2002-2006) there were 19 cities clustered in 4 demonstration projects, within CIVITAS II (2005-2009) 17 cities in 4 demonstration projects, whilst within CIVITAS PLUS (2008-2012) 25 cities in 5 demonstration projects are taking part. These demonstration cities all over Europe are funded by the European Commission.

### Objectives:

- to promote and implement sustainable, clean and (energy) efficient urban transport measures
- to implement integrated packages of technology and policy measures in the field of energy and transport in 8 categories of measures
- to build up critical mass and markets for innovation

### Horizontal projects support the CIVITAS demonstration projects & cities by :

- Cross-site evaluation and Europe wide dissemination in co-operation with the demonstration projects
- The organisation of the annual meeting of CIVITAS Forum members
- Providing the Secretariat for the Political Advisory Committee (PAC)
- Development of policy recommendations for a long-term multiplier effect of CIVITAS

### Key elements of CIVITAS

- CIVITAS is co-ordinated by cities: it is a programme “of cities for cities”
- Cities are in the heart of local public private partnerships
- Political commitment is a basic requirement
- Cities are living ‘Laboratories’ for learning and evaluating

## 1.2 Background ARCHIMEDES

ARCHIMEDES is an integrating project, bringing together 6 European cities to address problems and opportunities for creating environmentally sustainable, safe and energy efficient transport systems in medium sized urban areas.

The objective of ARCHIMEDES is to introduce innovative, integrated and ambitious strategies for clean, energy-efficient, sustainable urban transport to achieve significant impacts in the policy fields of energy, transport, and environmental sustainability. An ambitious blend of policy tools and measures will increase energy-efficiency in transport, provide safer and more convenient travel for all, using a higher share of clean engine technology and fuels, resulting in an enhanced urban environment (including reduced noise and air pollution). Visible and measurable impacts will result from significantly sized measures in specific innovation areas. Demonstrations of innovative transport technologies, policy measures and partnership working, combined with targeted research, will verify the best frameworks, processes and packaging required to successfully transfer the strategies to other cities.

## 1.3 Participant Cities

The ARCHIMEDES project focuses on activities in specific innovation areas of each city, known as the ARCHIMEDES corridor or zone (depending on shape and geography). These innovation areas extend to the peri-urban fringe and the administrative boundaries of regional authorities and neighbouring administrations.

The two Learning cities, to which experience and best-practice will be transferred, are Monza (Italy) and Ústí nad Labem (Czech Republic). The strategy for the project is to ensure that the tools and measures developed have the widest application throughout Europe, tested via the Learning Cities' activities and interaction with the Lead City partners.

### 1.3.1 Leading City Innovation Areas

The four Leading cities in the ARCHIMEDES project are:

- Aalborg (Denmark);
- Brighton & Hove (UK);
- Donostia-San Sebastián (Spain); and
- Iasi (Romania).

Together the Lead Cities in ARCHIMEDES cover different geographic parts of Europe. They have the full support of the relevant political representatives for the project, and are well able to implement the innovative range of demonstration activities.

The Lead Cities are joined in their local projects by a small number of key partners that show a high level of commitment to the project objectives of energy-efficient urban transportation. In all cases the public transport company features as a partner in the proposed project.

## 2. Brighton & Hove

Brighton & Hove is a historic city, in the south-east of England, known internationally for its abundant Regency and Victorian architecture. It is also a seaside tourist destination, with over 11km of seafront attracting eight million visitors a year.

In addition, it is a leading European Conference destination; home to two leading universities, a major regional shopping centre, and home to some of the area's major employers. All of this, especially when set against the background of continuing economic growth, major developments across the city and a growing population, has led the city council to adopt a vision for the city as a place with a co-ordinated transport system that balances the needs of all users and minimises damage to the environment.

The sustainable transport strategy that will help deliver this vision has been developed within the framework of a Local Transport Plan, following national UK guidelines. The ARCHIMEDES measures also support the vision, which enables the city to propose innovative tools and approaches to increase the energy-efficiency and reduce the environmental impact of urban transport.

### 3. Background to the Deliverable

The city council and the local bus company have had a bus quality partnership since 2000 and have won major national awards and recognition for bus accessibility policies, the real-time information system and for innovations which have helped to increase bus patronage year on year, every year, since 1997, against national trends. Over the last ten years bus patronage in Brighton & Hove has grown by well over 50%, making the city's network one of the most intensively used in the UK outside of London. Currently approximately 1 million journeys are made by bus in the city every week.

The multi-modal ticketing project is just one of the latest innovative schemes designed to generate further increases in usage of the bus network, with resulting downward effects on car traffic and thus an increase in air quality and improvement in the general environment in the city.

#### 3.1 Summary Description of the Task

The main aim of this project is to increase the number of people travelling by bus and train to/from and within the city of Brighton & Hove by offering an attractive, simple, multi-modal ticketing offer that provides good value for money. Increasing the number of people travelling by bus and train will discourage car use and thus result in less congestion, more reliable bus services, quicker journey times, less pollution and an improved general environment in the city.

## 4. Multi-modal Ticketing in Brighton & Hove

### 4.1 Description of the Work Done

This section provides a brief overview of the work performed to date.

Ticketing equipment began to be delivered to the bus company from June 2010 with significant testing then taking place and all on-bus equipment was installed on all 280 vehicles in March 2011.



**Figure 1 – Smartcard Reader**

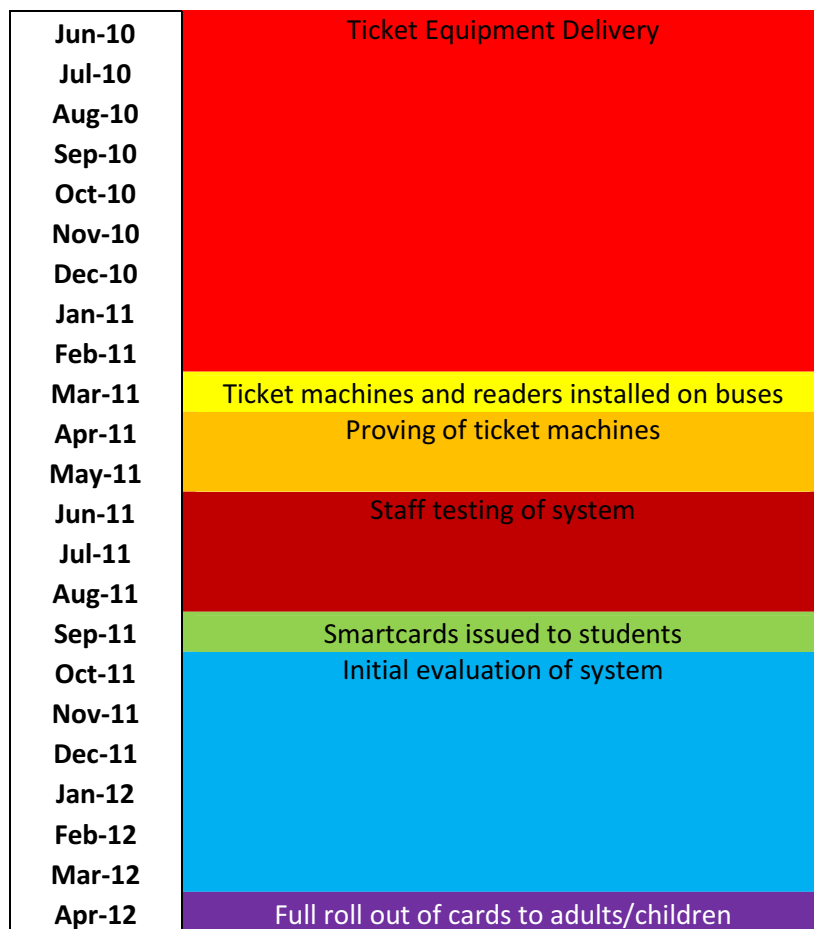


**Figure 2 – Ticket Machine**

Behind the scenes smartcard equipment was delivered from March 2011 onwards, and smartcards were in use by June 2011, with a further part roll-out from September. A full commencement of roll-out amongst bus passengers began in April 2012 and met with immediate considerable success: 2,000 cards were issued in the first 5 days and over 12,000 in the first month. Approximately 20,000 journeys per day were being undertaken by smartcard by the end of the first full month.



**Figure 3 – Smartcard Design**



**Figure 4 – Timeline of Events**

This was all somewhat later than what was originally envisaged for reasons that have been previously notified in detail to The European Commission, and which are summarised in section 4.4 of this report.

## 4.2 Summary of Activities Undertaken

As an expansion of the brief details provided above in 4.1, a large implementation team was set up within the bus company in order to move this project forward as it effectively encompasses every department and changes the way business is undertaken.

Discussions began in earnest following delays to the project documented elsewhere, although ultimately it became apparent that only one ticketing equipment supplier (VIX-ERG – [www.vixtechnology.com](http://www.vixtechnology.com)) would be in any position to work with us to enable bus and train integration of a smartcard system within a reasonable timeframe (for both this ARCHIMEDES project and the requirements of the UK government in awarding the local train franchise) that would also be compatible with the national smartcard standard of ITSO. No other ticketing equipment suppliers at the time were as advanced working on this as VIX-ERG, which meant they were the only option. Smartcard-producing equipment and back-office smartcard purchasing software are all separate but all have to talk with each other and the national smartcard server too, and this was a key aspect



in these additional suppliers getting the business. Our own specification was that all our existing products had to be issued and accepted by the ticket machines and through smartcard technology too, and there had to be a lot of scope for flexibility in terms of doing special ticketing offers and introducing new and enhanced ticket ranges at short notice based on customer feedback.

The introduction of the smartcard-compliant ticket machines on all 280 buses was the first implementation hurdle undertaken. This in itself required a new software reporting system (EP Morris) to be introduced which was capable of merging with previous reporting systems to provide seamless data transfer. This was based on an off-the-shelf package, but heavily modified to take into consideration our reporting and accounting requirements. The implementation of this went very smoothly, as does continued operation of this software. This is also separate from the individual ticket machine reporting software that could not integrate with more systems, hence our purchase of the EP Morris system.

On-bus smartcard readers were also introduced at the same time (purchased as a package with the ticket machines). Extensive smartcard producing equipment was also required and began to be delivered during March 2011 and following background testing began to be tested by staff, initially in an office environment and then on buses from June 2011 (using staff cards to test the hardware and software), before roll-out to selected customers during September 2011.

Students were selected first as historically they are the most technologically savvy and up for trying out something new, and particularly as the start of the new academic year tied in with our plans for initial roll-out. Students are a very valuable market and so it also made commercial business sense to launch it to them first. It also made sense for the launch to be staggered in order to limit the number of cards that were issued and minimise risk and prevent a deluge of enquiries and potential issues, all of which would have taken up valuable staff resources and could have meant a public relations backlash. Cards were handed out at freshers' fairs and on-campus to encourage take-up of the system. It gave us very useful feedback as to how people use their cards on the bus, what they think of the system overall, and the reporting and accounting side of the system. There were a number of issues, not least with communication and the reporting side, which took some time to sort out and so eliminate risks, and following continued experience and development, full roll-out commenced to all bus customers in April 2012.

A comprehensive audit survey amongst passengers is presently being undertaken during preparation of this report, including whether using the smartcard encourages increased use of public transport, and thus less use of the car, and also whether it makes it easier to pay for journeys. A full analysis of the detail of this is expected during summer 2012. These results will feed into the evaluation process of the ARCHIMEDES project.

### 4.3 Main Outcomes

Despite the issues identified in this report and elsewhere which delayed in the implementation, now that it is in place, the system is a real success. Within the first few weeks of the initial roll-out to the student population in September 2011, some 12,000 journeys per day were being undertaken on smartcard, plus a further 37,000 on national concessionary passes (this is a compatible pass issued by the UK government for those aged 60 and over to obtain free bus travel but is only included here for information). On roll-out to further customers in April 2012, some 2,000 cards were issued within 5 days and it is therefore not unreasonable to expect that within a short timeframe, some half of all journeys each day taken by bus in Brighton & Hove may be undertaken with a smartcard, which in general terms would therefore be a huge number compared with other operators and areas elsewhere in the UK. Whilst the train side is still in development but will be coming on board shortly too, this can only result in further take up of the smartcard option.

### 4.4 Problems Identified

As noted in previous communications, the revised target for the integrated system to be fully operational by September 2012 is still on target. However, the whole project has been delayed by aspects outside the control of the city council, the bus company or the train company. The previous smartcard system being worked on had to be shelved shortly after commencement of the project due to the UK government re-letting the local train franchise, plus directing that the national smartcard standard for bus ticketing become ITSO ([www.itso.org.uk](http://www.itso.org.uk)), which was a different platform from what all bus operators at the time were working towards and hence plans for a completely new system had to be drawn up. With the award of the local train franchise to the incumbent operator being implemented from September 2009, work could then re-progress, however it was initially limited to the bus operator until October 2011 when train-only trials also began and full scale implementation co-ordination with buses will only properly begin in summer 2012.

Additionally, following initial roll-out of the bus system amongst the city's large university population in September 2011, a number of administration issues were identified (despite significant take-up) in the reporting side of the system, which took a lot of time to resolve and delayed further expansion of the system. These included financial accounting issues, whereby problems with balancing payments received in the travel shops were identified, as well as loading the smartcard system on to travel shop computers, and also taking into account procedures for lost cards. Communication of how to use and top up cards for customers was also continually evolving as it was a learning process all round.

Work is now well underway to merge the system with trains; however, this still requires some significant testing to take place. The issues in merging with the trains is that both the bus and train 'back office' systems need to talk to each other, and also to ensure that rail products on a card do not interfere with bus products on a card and vice-versa. There are also a lot more suppliers involved on the rail side, not least because of the fragmented nature of the UK passenger rail industry, and all of which take time to come

up with the goods from their side. To use the system on separate bus operators, whilst still somewhat complex, is much easier to set up than for train operators, as long as all bus operators involved have ITSO-enabled ticket machines. Such a scheme has already been implemented between bus companies in Oxford, although it is unlikely this will be added to trains in this particular city. One issue that remains for use on a range of bus operators would be the price of tickets; by law, UK bus operators are not permitted to discuss prices behind closed doors, and so this would need the involvement of the local authority to prevent companies involved in a scheme from charging different prices for effectively the same ticket or journey.

## 4.5 Mitigating Activities

The bus company has at all stages informed CIVITAS and the city council of the nature of any delays to the project, reasons for the delays and plans to get back towards the original schedule. The bus company has called on additional resources and assistance from suppliers, the parent company and by employing additional staff, in order to further develop the system and to counteract any problems that have been encountered and the project is now very much back on track and moving forward at rapid pace. Agreements (including warranty arrangements) are in place with all suppliers in case of any problems encountered to ensure a swift resolution to any issues and ensure that the support and service provided to customers is of the highest possible standard; indeed a dedicated Smartcard Customer Co-ordinator is now employed in order to ensure that the system works as well as it should for customers. The system certainly is doing its job, having taken longer to come to fruition than expected, although it continues to be an evolving process for all concerned.

## 4.6 Future Plans

It is intended to continue with the expansion of the multi-modal system. Following promotion of the full roll-out on-bus early in April 2012, significant take-up followed and it is hoped that this will continue. It is planned to have a price differential for smartcard tickets, so that these tickets will be cheaper than other tickets to encourage wider take-up of the system, and which in itself has much greater impact than cash and paper tickets. Further development of the project will include an enhanced ticket range, potential integration with the London 'Oyster' system (one of the most successful multi-modal smartcard systems in the world) and also include mobile top-ups of cards, plus mobile 'phones being used as smartcards in themselves through their SIM card; this technology is only just coming to the fore through the very latest mobile 'phones, but it is planned to grasp this as soon as possible with all the funding to be provided by the bus company, rather than Brighton & Hove city council (or other external partners). This is a further example of the extent of the public private partnership that therefore exists and the complete commitment of the bus company to make the system work. Potential also exists to develop inter-available tickets with other bus operators across the wider Sussex area, providing they have ITSO-compatible ticket machines that the UK government is now incentivising some smaller operators to purchase.

An aside, related to the ethos of CIVITAS ARCHIMEDES, is that the bus company is in the process of purchasing 13 hybrid-electric double-deck buses (representing an

investment of some £3.9million). Some of the funding for these has come from the UK government, who are funding most of the difference in price between a conventional diesel bus and an electric-hybrid bus (about £80,000 per vehicle). These vehicles are already reporting fuel savings of 30% with other bus operators, plus the hybrid system ensures that the vehicle engine is turned off when the bus is travelling below 20km/hour, thus improving the air environment in busy city streets when the vehicle is stationary at stops or moving slowly at traffic lights etc. These vehicles can therefore only be of benefit to the city of Brighton & Hove.