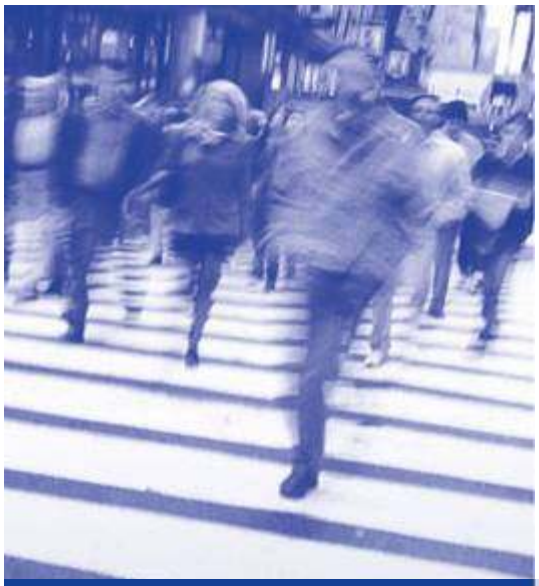

CiViTAS
Cleaner and better transport in cities

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

# Brighton & Hove

## T55.1 Cyclist Priority in Brighton & Hove

Brighton & Hove

February 2012

THE CIVITAS INITIATIVE
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# Contents

# 1. Introduction

## 1.1 Background CIVITAS

CIVITAS - cleaner and better transport in cities - stands for CIty-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 an 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

Cycling in urban areas is complicated by conflict with other road users. The issue is especially prevalent during rush hour and presents a barrier to using the bicycle to travel to and from work. In this measure Brighton & Hove's cycle priority demonstration planned to introduce innovative engineering measures along the city's cycle network in the CIVITAS corridor to enable cyclists to avoid delay. These measures were designed to reduce stop-start cycling conditions, improve cycling journey times and reduce cycle conflict with other traffic

## 3.1 Introduction to the Task

The original intention was that the majority of the measure would be focussed on the implementation of a 'Green Wave'. A green wave is an intentionally induced phenomenon in which a series of traffic lights are coordinated to allow continuous traffic flow over several intersections in one main direction. A series of lights installed in the ground alongside the cycle lane light up in sequence so that a cyclist who follows the lights will be guaranteed to arrive at the next traffic signals during a green light phase.

Unfortunately after the measure began budget pressures within Brighton & Hove Council meant that the amount of match funding available to the measure was significantly reduced, making it necessary to reduce the scope of the task to match the funds available. This meant that Green Wave (which it was estimated would cost up to 600,000 euros) was no longer feasible.

Therefore 3 alternative cyclist priority measures were identified that would achieve the objective of removing cyclist delay. The measures taken are described in the next section.

# 4. Deliverable Title

## 4.1 Description of the Work Done

The three measures were:

### 4.1.1 Cycle Ramps

The cycle ramp element of the project aimed to remove barriers for cyclists in various locations throughout the city where steps exist. Steps can be a real barrier for cyclists travelling around the city and this is particularly problematic at rail bridges, where cyclists must carry their bikes up and down the steps when accessing or exiting the station platforms. Rail bridges can also provide useful cut-throughs for cyclists wanting to travel from A-B using the shortest route. These cycle ramps are designed therefore to attempt to reduce the length of the cyclists' journey. The cycle ramps that did exist in some locations throughout the city were of poor

quality and often not used due to design flaws. This element attempts to overcome these design flaws and produce a cycle ramp design which will be accessible for cyclists.

### 4.1.2 Left turn for Cyclists at St James's Street

Amended signals phasing were introduced as part of a Mixed Priority Route scheme on a nearby street. This resulted in cyclists being unable to legally turn left from the Old Steine into St James's Street (2 major roads in the centre of Brighton). The proposal was to install a new cycle stop line and cycle signals to allow the left turn manoeuvre to be carried out legally and without affecting pedestrian flow or vehicle capacity.

### 4.1.3 Station Street

Station Street is located to the east of Brighton Rail Station, off Trafalgar Street. Access to the southern end of Station Street from Trafalgar Street was restricted to vehicles by a small "pocket park" featuring benches and cycle parking. The pocket park was not well used and offered room for improvement. The proposal was to enhance cycle access through an improved pocket park, resulting in better access for cyclists travelling between the North Laine / New England Quarter, whilst enabling the Station Street pocket park to fulfil its wider potential as a city asset for all.

## 4.2 Summary of Activities Undertaken

### 4.2.1 Cycle Ramps

**Stage 1: Preparation** *(January 2010 – September 2010)*

This involved research and consultation into innovative engineering solutions to provide priority for cyclists at 12 intersections in the CIVITAS area of Brighton & Hove.

In this measure Brighton & Hove's cycle priority project aimed to introduce innovative engineering measures along the city's cycle network in the CIVITAS corridor to enable cyclists to avoid delay. These measures will reduce stop-start cycling conditions, improve cycling journey times and reduce cycle conflict with other traffic.

In January 2010 a Brighton and Hove University lecturer for technology and design was contacted. This was to determine interest in asking students to enter a design competition for the Cycle Ramps as part of their second year design course.

In February 2010 design students were issued with a design brief to create a workable solution to assist in transporting bikes up stairs. London Road rail station steps were chosen as a staircase on which to design their product. It was made clear that any design should be made with the intention to roll-out across various locations where steps presented a barrier for cyclists.

In September 2010 8 groups of students presented their designs to a panel of judges including CIVTAS project managers, Brighton & Hove City Council Walking and Cycling officer, Highway engineers and Southern Rail facilities manager.

The panel agreed on the final winning design and offered a commission to the design students collectively named as Flow Creations, who came up with the Wave Design.

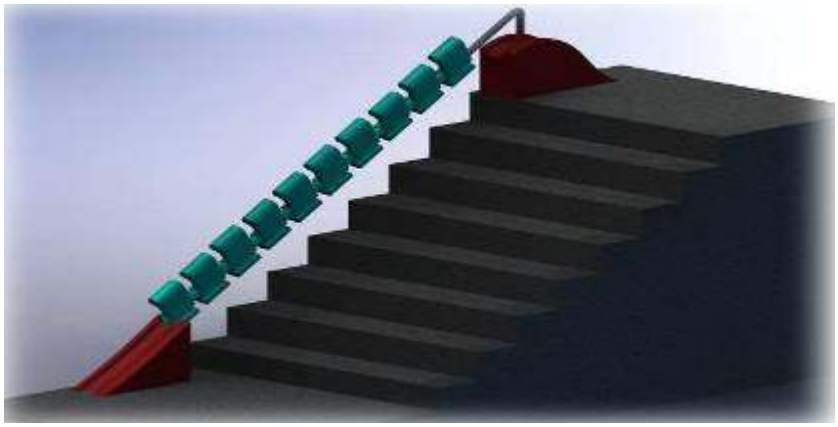

**Figure 1. Initial concept design**

With assistance from the BHCC highways engineering team the design was refined and amended.

**Stage 2: Decision making** *(September 2010 - April 2011)*

This involved choosing the sites, the measures to be implemented, and the suppliers.

The site locations where chosen where there was an obvious requirement for cycle access or travel within the CIVITAS area. Falmer Rail Station, London Road Rail Station and Preston Park Rail Stations were all chosen as potential locations where cycle stand should be implemented.

If the prototype is successful, the ramps could be implemented at all 3 stations and there is a possibility of including other stairs in the city where they create a barrier between cycle routes, such as Madeira Drive, thus delivering as many of the 12 junctions originally planned in the CIVITAS measure as we can within the revised, smaller budget.

**Stage 3: Implementation** (*April 2011 – September 2011)*

The prototype was trialled at the University of Brighton site in April. Although the design looked promising when trialled on a life sized basis there were technical problems with the moving mechanisms of the ramp.

The initial design is as follows.

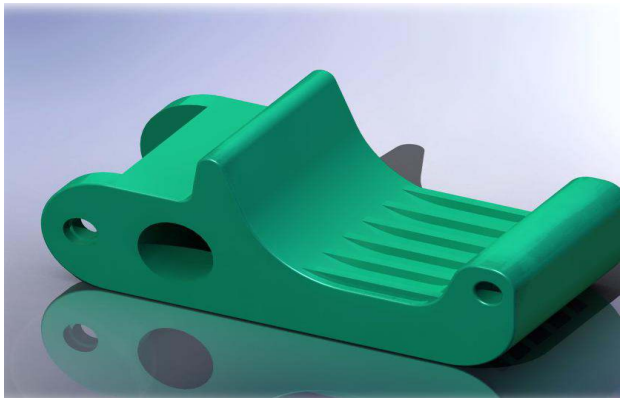

**Figure 2. Individual 'paddle' element of the ramp**

The individual mechanisms are designed with a raised lip to enable easier use of the ramp by allowing the bike to be at an angle.

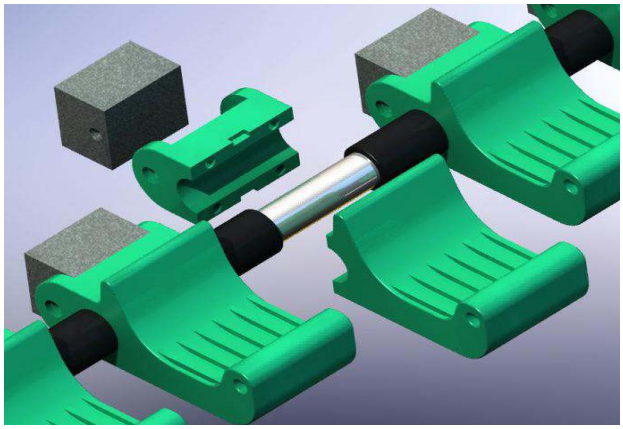

**Figure 3. Image showing how the ramp elements connect to each other**

Sections were then fixed to a solid pole and weighted to allow movement. Individual parts create a “wave” effect as the user goes up the stairs.

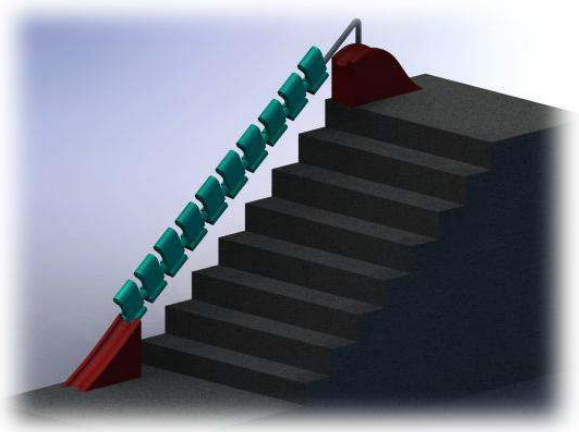

**Figure 4. Image showing how the ramp would look in situ.**

The fixture is designed in sections to allow adaptation so that it can be installed on a range of staircases.

Unfortunately, despite several design iterations, the decision was taken in September 2011 not to progress any further with the design as it was felt that the students had developed it as far as possible. Although the design had many positive features it was not of sufficient quality to be installed on the public highway.

### 4.2.2 Left turn for Cyclists at St James’s Street

A design for the scheme, shown below, was produced in April 2011 and contractors appointed.

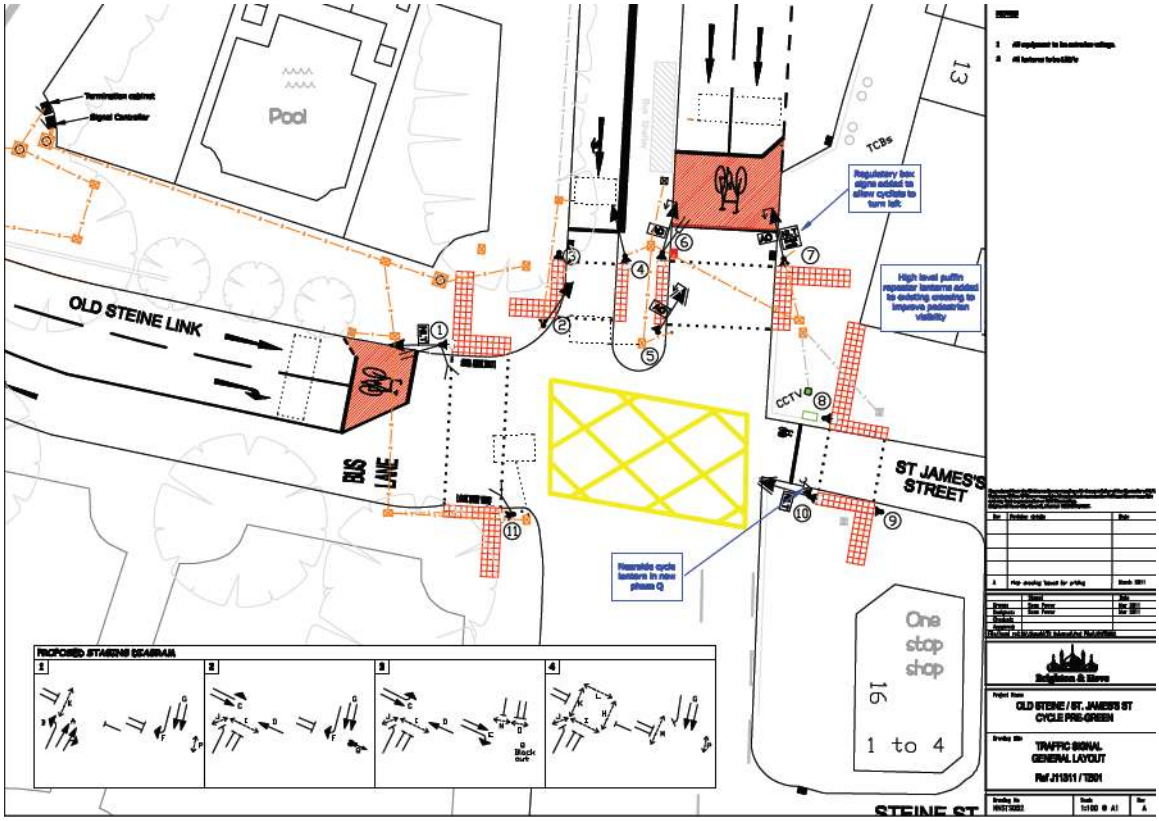


**Figure 5. Design drawing for the cycle left turn signals**

### 4.2.3 Station Street

Video analysis of the area was carried out in winter 2010. Observations of pedestrian and cycle desire lines were used to inform the re-design of the pocket park.

In early 2011 redundant street furniture was removed. During Spring 2011 a tendering process was started to appoint an artist to install a mosaic. An artist was appointed in September 2011 and the design pictured below was installed in October 2011.

**Figure 6. The mosaic laid out in the studio**

In November 2011 on-street consultation was carried out to inform the detailed design of seating provision. Local businesses and passers-by were engaged and asked for their views on what should be provided. Chairs were placed on the street so that consultees could experiment with different seating arrangements. As a result a seating brief was prepared and a street furniture designer was commissioned to design and install the seating element.

Unfortunately it was not possible to remove a telecoms utility box in the pocket park. Therefore an artist was commissioned in December 2011 to enhance the appearance of the box, resulting in the reproduction of the Manet painting Le D'jeuner sur l'Herbe on the northern side of the box. The photo below is a mock-up of the box:

**Figure 7. Station Street during implementation**

## 4.3 Main Outcomes

### 4.3.1 Cycle Ramps

Although the ramps were not developed to a point where they could be installed on the public highway the design was still successful in several ways.

One objective of the design was to produce a cycle ramp that could be installed on a narrow set of steps without taking away too much of the width of the steps from pedestrians. To achieve this the ramp was made from small sections attached to springs that, when not in use, were vertically parallel to the wall or railings on the side of the steps. The mechanism for doing this worked well in the following ways:

- the ramp was strong enough to hold cycles
- the mechanism for connecting the sections to each other enabled them to be progressively pulled down as the bike travelled along the ramp. Bicycles were therefore able to travel easily along the ramp.

A problem with existing cycle ramps is that the force required to push bikes up ramps can prevent some people from using them. The design was intended to reduce the force required as the action of the spring-mounted sections would help to propel the bike along the ramp.

### 4.3.2 Station Street

The major objective of the Station Street element was to improve accessibility for cyclists. This was achieved through the installation of dropped kerbs and reduction of street clutter (such as benches) on the cyclist desire line.

However the objective was also to improve accessibility by improving the street scene in the area and encouraging people who otherwise would not have used the area, to use it. This was achieved through providing the mosaic, seating, and BT box artwork, and re-arranging the layout of street furniture. Initial anecdotal evidence is that this has been successfully achieved, although formal evaluation results are still to be compiled.

### 4.3.3 Left turn for Cyclists at St James's Street

The main outcome of the St James's St cyclist left turn is that cyclists are able to legally make the left turn manoeuvre, whereas previously they could not. Previously cyclists either to dismount their bikes and walk or cycle a lengthy detour (approximately 400 metres). Removing stop-start cycling conditions was a major objective of this measure and this element has helped to achieve this at a key location on a major cyclist route.

## 4.4 Problems Identified

### 4.4.1 Cycle Ramps

Several design issues were identified with the cycle ramps during the development process. The major issue was insufficient tension in the mechanism that sprung the ramp sections from a horizontal to a vertical position. This meant that the ramps would not consistently spring back in to a vertical position after use, thus causing an obstruction to pedestrians using the steps. A number of improvements were made that improved the situation but ultimately the problem was not completely resolved.

A problem with existing cycle ramps is that the force required to push bikes up ramps can prevent some people from using them. The design was intended to reduce the force required as the action of the spring-mounted sections would help to propel the bike along the ramp.

As a result of changes to the design intended to improve tension in the lifting mechanism, the height of the ramp above the steps was increased. This had the unintended consequence of making it harder for users to push bikes along the ramp. A compromise had to be found whereby the ramp was slow enough to aid users pushing their bikes but high enough to retain tension. Further work could be carried out on this element to lower the height of the ramp without affecting tension.

The prototype experienced problems generally when designing for different sets of steps. Variations in height and width of steps meant that significant alterations were necessary. Although it was technically possible to make these alterations this is an issue that will have time and cost implications when implementing the ramps at other locations.

### 4.4.2 Station Street

The BT box was identified as an unsightly obstruction and the feasibility of removing it from the site was examined. Unfortunately it was not possible to move it and therefore alternative plans were put in place to make it more attractive through the use of artwork, and to reduce the amount of obstructing it caused by creating a new cyclist desire line that avoided the box.

### 4.4.3 Left turn for Cyclists at St James's Street

Implementation was initially delayed due to software problems. The green cycle light was not configured as a traffic phase, meaning it did not communicate with other traffic signals at the junction. As a result, if the green cycle light was displayed at the same time as a green traffic light for a conflicting traffic stream it would not register this as a conflict and shut down. This created an obvious safety risk and therefore the signals contractor was asked to review the software design and correct the problem.

## 4.5 Future Plans

### 4.5.1 Station Street

In February 2012 additional seating is due to be installed on Station Street and the utilities cabinet will be decorated.

Video monitoring has been carried out prior to installation and will be carried out shortly to assess the difference. Numbers of users will be assessed as well as well as user behaviour.

### 4.5.2 Cycle Ramps

The student team intend to pursue work on the design in the future, although the council's involvement with the project has ended.

### 4.5.3 Left turn for Cyclists at St James's Street

Video monitoring has been carried out prior to installation and will be carried out shortly to assess the difference. Numbers of users will be assessed as well as well as the change in behaviour of drivers and cyclists when they interact with each other at the junction.