CiViTAS
Cleaner and better transport in cities
ARCHIMEDES

CASE STUDY

"TESTING THE AIR" IN BRIGHTON & HOVE

INNOVATIVE TRANSPORT TELEMATICS

This measure involved the use of static and mobile air quality monitoring equipment to record and analyse ambient air quality. The data was displayed in real time in schools participating in the project; and used as the basis for an educational initiative on the effects of emissions and pollution.

Municipal context

The city of Brighton & Hove is a thriving "city by the sea" and the largest urban centre on the south coast of Britain lying approximately 50 miles south of London and attracting in excess of 8 million visitors a year.

The city has an estimated population of 250,000 and is a popular base for London commuters, benefitting from excellent communication links.

The city is a major tourist, leisure and conference destination and hosts a year round calendar of festivals and events. Tourism supports nearly 12 percent of the city's full time equivalent jobs. The city has two universities with 32,000 students, many of whom stay to live in the city post-graduation.

These facts, together with key regional road corridors coming into the city on a Victorian road network and constraints of Regency buildings, the South Downs and the seafront, bring specific challenges creating high levels of traffic congestion and air pollution. The vision for the city as a place with a co-ordinated transport system that balances the need of all users and minimises damage to the environment is key.

The transport strategy to deliver that vision was developed within the framework of a local transport plan. The CIVITAS ARCHIMEDES measures were therefore also developed to support the vision and have a collective aim to reduce road traffic, address congestion and improve air quality by using innovative tools and techniques.

MUNICIPAL PROFILE

LOCATION
Brighton & Hove, United Kingdom

POPULATION
250,000

LAND AREA
87 km^2

CIVITAS BUDGET
EUR 2,577,900

BRIGHTON & HOVE IN CIVITAS

Brighton & Hove (United Kingdom) participated in CIVITAS ARCHIMEDES, an innovative collaboration between the cities of Aalborg (Denmark), Brighton & Hove (United Kingdom), Donostia-San Sebastian (Spain), Iasi (Romania), Monza (Italy) and Usti nad Labem (Czech Republic). ARCHIMEDES stands for "Achieving Real CHange with Innovative transport MEasures Demonstrating Energy Savings"

PROJECT INFORMATION

The ARCHIMEDES cities implemented a strong and coherent package of 83 activities to make transport more energy efficient, safer and more convenient. An increased share of clean engine technology and fuels has significantly contributed to achieving this goal. With a strong focus on education and trainings for students, citizens and practitioners, ARCHIMEDES cities greatly benefited from sharing their experiences and learning from each other. The project ran from 2008-2012.

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As winner of National Transport Authority of the year in 2005 and 2010, and runner-up in the CIVITAS 2012 City of the Year Award, Brighton & Hove has a reputation for innovation and delivering cutting edge solutions.

Introduction

The primary objective of the project was to monitor ambient air quality around selected schools in order to educate pupils about their environment and how local transport activity can affect this.

CIVITAS ARCHIMEDES represented a good opportunity for the city to test new solutions in this area. Trials were carried out at three selected schools in the CIVITAS corridor and designated junctions nearby to make comparisons.

It should be noted that the original project description proposed measuring the emissions of passing vehicles and "grading" these emissions levels by displaying a highly visible score on road-side Variable Message Signs (VMS). However, following an initial scoping exercise, the project was amended due to the fact the technology available to measure emissions from specific cars was deemed to be unreliable and likely to require significant expense to develop.

Taking a closer look

Imperial College, London was appointed in October 2009 to work in partnership with the City Council on the project.

Imperial College was to deliver the educational component of the project through its leadership of OPAL – a national initiative that aims to encourage people to investigate study, enjoy and protect their local environment – and outreach project, while Duvas Technologies was to provide the equipment required.

Between November 2009 and March 2010, Duvas Technologies developed the technology that enabled both traffic emissions and ambient air quality to be monitored simultaneously using two forms of equipment sited on both sides of the adjoining road (the "Open Path" (OP2) system), and on the school buildings respectively (through monitoring equipment known as "006").

Stage 1:

Using the first school (Balfour Junior) as an example, the first step of the implementation process was the monitoring of emissions from passing vehicles in close proximity to the school by using the innovative OP2 system.

The data was then displayed in real time using variable message display equipment installed in the school to raise awareness of the impact that individual vehicles can have on local air quality.

The initial work at Balfour Junior School took place between February and summer 2010. Significant progress was made during this time on the development, calibration and testing of the open path technology. A further, full scale, deployment then took place in October 2010.

Staff from OPAL attended Balfour Junior to deliver the educational programme. The overall educational objective was to allow pupils to develop an understanding of air quality, pollutants, and their causes and effects. Pupils carried out experiments with a portable unit that could move around the playground to see how emissions travel.

Year 5 and 6 students from Balfour Junior attended Imperial College in London in September 2010 where they learnt about science, their environment and how local transport activity might affect it. Additional to this, ambient air quality within the local vicinity of school grounds was monitored.

The open path unit (OP2) system was decommissioned at Balfour Junior and re-installed at the next school after several technical upgrades by Duvas Technologies.

Stage 2:
The second stage of the project took place in 2011 with the participation the second school (Elm Grove) when children and teachers took part in the air monitoring trials both in and around the school. The educational programme included lessons on the impact of air pollution, the local significance of biodiversity and visits to Imperial College and the Science Museum in June 2011.

Stage 3:
The third stage of the project involved the participation of St Bartholomew's School. This took place in June 2012 and also involved the use of mobile air monitoring equipment, in addition to the static monitoring equipment, installed on the school's premises.

To further promote the project, pupils from Elm Grove Primary School also made a short film about the groundbreaking science project. "Testing the Air" is narrated by the children and shows how they had monitored air quality both in the playground and outside the school.

The video is available at: http://bit.ly/civitas-brighton-video

Results

The school survey from St Bartholomew's School showed 100 percent awareness, and 70 percent acceptance of the project in the term following the monitoring activities. A similar survey from Elm Grove School produced 100 percent awareness and 92 percent acceptance, while Balfour Junior School produced 100 percent awareness and 63 percent acceptance.

The sample base was not large enough to quantify modal shift to more sustainable forms of transport following Walk to School week and the work that took place during the project. However, it may be that similar work in the future at these and other schools could produce more significant and robust results.

The amount of monitoring data available has meant that it has not been possible to quantify a statistically significant difference between the before and after emissions and air quality data.

Lessons learned

The work undertaken has been successful in proving the new equipment development exponent of the project and has thus been a success.

The project has informed and assisted the pupils at the three schools involved in understanding the effects of emissions on pollution. By educational measures such as this project, changes in the travel to school mode to more sustainable means may be encouraged.

Technology options – Technology developed by Duvas Technology has been tested during the course of this project and is likely to be appropriate for similar projects in other cities. However, there may be alternative ways to monitor vehicle emissions and communicating this information, to partners and stakeholders, which could be investigated.

Alternative approaches – The measure in its original form involved the monitoring of individual vehicles emissions and feeding this information back in real time to the driver of the vehicle via a Variable Message Sign. This

was subsequently thought to not be feasible in Brighton at this time, but with possible advances in technology and in other contexts this could still prove to be a worthwhile area to pursue.

Monitoring technology – It is essential to ensure that the monitoring technology used is capable of producing the results required for the evaluation of the project.

Data gathering – The availability of suitable tried and tested technology should be established before it is used in field trials to ensure that robust data gathering is possible.

Communications and power – The selected locations should be suitable and have available power and data communication (Wi-Fi, etc.) in advance.

Data retention and control – Control of the data gathering during the project and of all before and after surveys should be retained.

Project management – To maintain continuity, changes to project management staff should be minimised during the life of the project.

School involvement – School partners should be involved at an early stage as their participation and enthusiasm are essential.

Upscaling and transferability

Similar impact analysis could be applied to other initiatives such as Bike Week, Car Free Day and Walk to Work Week for example, with educational programmes tailored to each event and varying audiences. VMS could be used at work places and or public domains in order to raise awareness.

Emission data could be displayed via VMS on busy routes within the city, or at popular tourist locations. General educational leaflets could be mailed to residents or made available online.

The initiative as it currently stands could be rolled out at many other schools across Brighton & Hove.

The educational programmes could become a fixed part of school curriculum.

There are no plans for the expansion of this measure in Brighton & Hove currently. The contract between Imperial and Brighton & Hove City Council was for a fixed period of time and there is not currently the funding to renew it.

However as part of the measure Imperial University developed new emissions monitoring technology. This technology will be used by the university for future research. The university's school engagement unit will also continue to operate and will offer similar programmes to other schools in the country.

The measure is easily capable of being transferred to other cities, and would have particular benefits where a major part of travel journeys to school are by car or where there are significant issues associated with vehicle emissions and pollutants.

Budget and finances

Each school participating in the measure received EUR 33,433 to implement their component.

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