



CIVITAS
Cleaner and better transport in cities
RENAISSANCE

CASE STUDY



FREIGHT CONSOLIDATION IN BATH

URBAN FREIGHT LOGISTIC



The negative impacts of current levels of traffic in the World Heritage Site of Bath are a key concern. These impacts include traffic congestion, poor air quality, excessive noise levels, visual intrusion and damage to the fabric of historic buildings. Whilst all forms of motorised vehicle can be seen to be contributing to these problems, heavy goods vehicles (HGV) have an impact disproportionate to the number of vehicle movements. Under CIVITAS RENAISSANCE, a freight consolidation centre was established to serve Bath in order to reduce deliveries into the city, resulting in an average 76 percent reduction in deliveries to participating businesses.

Municipal context

Located in the south west of England, the city of Bath has been a UNESCO World Heritage Site since 1987, and is famous for some of Europe's finest Roman remains and 18th century architecture.

The city is a major tourist attraction located in the valley of the river Avon. It was founded by the Romans in AD 63 around the only naturally occurring hot springs in the United Kingdom. During the Georgian era of the 18th century, the city became a popular spa resort, which led

to a major expansion and left a rich heritage of exemplary Georgian architecture crafted from Bath stone. Today, tourists are also attracted by a variety of theatres, museums and other cultural and sporting venues. Over one million overnight visitors and 3.8 million day visitors come to the city each year.

The impact of congestion is a key concern for the city. The contribution of heavy-goods vehicle (HGV) traffic to poor air quality, noise, severance and damage to the fabric of historic buildings is disproportionate to the volume of HGV traffic.

MUNICIPAL PROFILE

LOCATION
Bath, United Kingdom

POPULATION
80,000

LAND AREA
29 km²

CIVITAS BUDGET
EUR 6,500,000



BATH IN CIVITAS

Bath participated in CIVITAS RENAISSANCE. Under the motto of “Testing Innovative Strategies for Clean Urban Transport for historic European cities”, the project connects five cities that face mobility challenges through seasonal tourism: Perugia (Italy), Bath (UK), Gorna Oryhavitsa (Bulgaria), Szczecinek (Poland), and Skopje (Macedonia).

PROJECT INFORMATION

CIVITAS RENAISSANCE aims to demonstrate how the legacy of the renaissance can be preserved and developed through innovative and sustainable clean urban transport solutions. The project aims to test and develop a valuable, reliable and integrated package of mobility measures that will make historic cities cleaner and safer.

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Traffic from Heavy Good Vehicles

Introduction

The delivery of goods makes up a significant share of traffic in European cities and is a major contributor to deteriorating air quality, rising carbon emissions and congestion. More efficient freight deliveries, such as the use of freight consolidation, can reduce congestion, lower emissions and free up space for sustainable modes.

As part of CIVITAS RENAISSANCE in Bath, an urban freight consolidation scheme has been established with the aim of reducing the number of goods vehicle deliveries made to city centre businesses. The scheme seeks to reduce the number of large delivery vehicles entering the city centre by providing a facility, conveniently situated for access from the highway network, where goods can be consolidated for onwards dispatch at pre-arranged times using an electric vehicle.

Taking a closer look

The urban freight consolidation centre (UFCC) serves both the city of Bath and the neighbouring city of Bristol, which first set up a freight consolidation operation as part of the CIVITAS VIVALDI project in May 2004. Freight consolidation centres serving city centre businesses are not common in the UK

and this is the first such centre to serve two neighbouring cities.

The urban freight centre is operated by subcontractor DHL Supply Chain, and was offered to Bath business at no charge for the first 15 months of operation. Following this initial period, charges of £9 per cage and £12 per pallet were applied. The service is marketed to Bath businesses by DHL with the support of the Bath & North East Somerset Council.

The measure includes a number of innovative aspects:

- Freight consolidation in urban centres is in its infancy with very few actual schemes operating, and no other small-to-medium size historic cities in the UK operate a freight consolidation scheme.

- The scheme utilises new technology in the form of an electric, low-emission freight vehicle as a key part of the scheme.
- The scheme is operated in partnership with Bristol City Council, and is the first consolidation centre in the UK to serve two cities.

DHL established the Bath consolidation centre at their depot, close to the motorway at Avonmouth near Bristol, from where they already operated a freight consolidation scheme for the City of Bristol.

Goods are dispatched in pre-arranged time slots into central Bath using two low emission/low carbon Smith Newton nine tonne electric delivery vehicles. Recyclable waste can also be collected from participating businesses. The total distance for such a return journey is around 70 km.

BACKGROUND INFORMATION

Under the traditional supply chain mode, goods are delivered independently to retail centres and delivery vehicles often experience, and contribute to, congestion entering the city and have to find a convenient location to stop and unload goods. Businesses are usually not aware of the exact time that deliveries will be received. With the consolidation supply chain, goods for the participating businesses are delivered to a warehouse conveniently situated for access from the strategic highway network on the edge of the city, meaning that large delivery vehicles do not have to enter the city. The goods are consolidated for onwards dispatch in pre-arranged time slots using a low emission/low carbon electric delivery vehicle.



Freight consolidation electric vehicle

The first Bath delivery was made on 5 January 2011, and five businesses joined the scheme in the first two months of operation. This increased to a total of 19 participating businesses as the scheme continued.

Results

From January 2011 to end of April 2012 the number of delivery journeys into Bath was reduced by 1,016. On average the number of deliveries to participating outlets has been reduced by 76 percent, exceeding the target set at the start of the project.

The Council is working towards the target of reaching a break-even point for scheme operation within four years. The first step in this process was achieved by introducing a small charge of £9 per cage/£12 per pallet to participating businesses in April 2012, which reduced the cost of subsidising the scheme from EUR 21,910 in year 1 to EUR 141,083 in the second year of operations.

The electric vehicles used by the consolidation centre achieved a 55.7 percent reduction in energy consumption over equivalent diesel delivery vehicles.

The use of the electric vehicle helped reduce CO₂ and other pollutant emissions, by avoiding

a number of trips to Bath that would have taken place by diesel-powered trucks and vans. In particular, the following cumulative reductions were obtained through the demonstration, from January 2011 to end of April 2012:

- CO₂ 10,179.74 kg;
- CO 60.83 kg, NO_x 330.86 kg; and
- PM10s 9.89 kg.

The average concentration of Nitrous Oxide levels in Bath in 2011 has fallen to 45µg/m³. By way of comparison, in 2007 the average concentration of this pollutant was found to be in the range 48-50µg/m³. The standard deviation associated with each year's measurement is 0.7µg/m³, hence small enough to detect the required change in average NO₂ concentration levels. This change however cannot be solely attributed to this measure.

Users of the scheme showed high levels of satisfaction with the service provided and were positive about the demonstration. 81 percent of participating retailers surveyed were very likely to recommend the scheme to other businesses; the other 19 percent were quite likely to recommend the scheme.

DHL reported that deliveries were made on time and with no damages. To verify this, service quality has been assessed through a qualitative survey of participating businesses. Almost all

interviewed businesses confirmed that deliveries were made on time and they experienced no damages to their deliveries.

Lessons learned

The average number of deliveries to participating outlets has been reduced by 76 percent. During the demonstration project 19 retail outlets joined the freight consolidation scheme and at this scale the reduction in total deliveries across the city is small. However, if the number of businesses involved in the UFCC could be significantly increased it would have a major impact on the number of delivery vehicles entering the city.

The demonstration project has highlighted cost savings that are being achieved by logistics companies who deliver into the UFCC depot and avoid the need to deliver the last mile into congested city centres. Developing a new business model which can utilise these cost savings as a revenue stream for the consolidation centre could overcome the requirement for subsidy and produce a self-financing UFCC operation.

Lessons were learned during the procurement process to identify a subcontractor with the necessary expertise to operate the scheme. Only two companies submitted bids, but the successful tenderer withdrew their bid and the second bid was invalid. Under EC procurement rules the Councils entered into the "Tender Negotiation Phase" with the two bidders and a preferred bidder was identified and the contract awarded.

The consolidation centre contract was ambitious in specifying a fully electric delivery vehicle. The Bristol urban freight consolidation operation had established that it was possible to use a Smith Newton electric vehicle to undertake onward deliveries, but a much greater range of over 70kms was required to make a return journey to Bath from the UFCC depot. DHL initially overcame this issue by increasing the number of batteries used on the delivery vehicle by 33 percent, which worked well for the first months of the operation. However, towards the end of the first year the original Sodium Nickel batteries were over five years old and becoming difficult to maintain and support and it was decided that the



Sodium Nickel batteries in both vehicles would be replaced by new Lithium-Ion batteries.

Experience has shown that a wide variety of businesses have joined the scheme including clothes and shoe retailers, hotels, stationers, jewellers and phone retailers, both local and national.

The environmentally friendly electric delivery vehicles have made the UFCC scheme in Bath more attractive to the city's businesses, as it enhances their green credentials.

Upscaling and transferability

Bath & North East Somerset Council continued operation of the UFCC beyond the end of the CIVITAS demonstration project to 31 December 2012. The Council is working with Bristol City Council to identify funding opportunities to enable the consolidation operation to continue until at least 2015.

One of the challenges faced is how local governments can encourage the introduction of consolidation initiatives, without the requirement for on-going subsidies from budgets that are already stretched. Bath & North East Somerset Council is continuing discussions with Bristol City Council, DHL

and other partners with a view to developing a new self-financing business model. The aim of the new model is to direct the cost savings that freight operators gain from the scheme, by avoiding the need to deliver the last mile into congested city centres, to provide a new revenue stream for the consolidation centre.

The two participating local authorities, Bath & North East Somerset Council and Bristol City Council, are considering options to enable the electric UFCC vehicles to use the extensive public transport priority measures already in place on congested east-west route from the UFCC in Avonmouth to Bath. Use of bus priority measures will establish a "green corridor" that the UFCC delivery vehicle can use to significantly reduce delivery time between the UFCC, central Bristol and Bath and improve the efficiency of the operation.

Bath & North East Somerset Council is proposing to restrict vehicle access to parts of the main shopping area in central Bath between the hours of 10am and 6pm. This will include delivery vehicles. Under this proposal the UFCC's electric delivery vehicles will continue to have 24 hour access to the restricted area, and this feature is expected to act as a catalyst to encourage more businesses in central Bath to join the UFCC scheme.

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