



CiViTAS
Cleaner and better transport in cities
M I M O S A

CASE STUDY



TAKING A MORE SUSTAINABLE APPROACH TO FREIGHT

URBAN FREIGHT LOGISTICS



Utrecht set to carry out an ambitious Action Plan for Sustainable Freight Traffic during its time as a CIVITAS demonstration city. The results and lessons learned serve as a model for optimal measure integration. The plan aimed to bundle, innovate and optimise freight traffic in the city. It was also necessary to make freight movement greener by building interlinkages between related CIVITAS measures, such as flexible access for cleaner freight traffic, the Cargohopper electric delivery van, "Beerboat" canal deliveries, construction logistics plan and research into bundling pick-up points. Results have already demonstrated reduced traffic flow, noise and air pollution, increased safety, as well as new opportunities and cost-savings for business.

MUNICIPAL PROFILE

LOCATION

Utrecht, the Netherlands

POPULATION

316,277

LAND AREA

99.3 km²

CIVITAS BUDGET

EUR 4.980.619,56

Municipal context

The historic city of Utrecht is the fourth largest city in the Netherlands, and the capital of Utrecht Province. In addition to the many tourists that visit the city each year, 50,000 students attend numerous third-level education establishments in the city, among them the largest university in the Netherlands. Its central location makes Utrecht a vital transport node in the region where major roads and railways intersect, attracting all types of enterprises.

The city's mobility strategy aimed to reduce the car use growth by 50 percent by 2030, and cutting CO₂ emissions by at least 30 percent by 2020.

Traditionally, the main goal was traffic management, however, during CIVITAS Utrecht chose a mix of activities that also aimed at changing behaviour. Citizens engagement is vital in order to do this in a meaningful way and CIVITAS provided the opportunity to put theory into practice, generating new ideas with several participation projects.



UTRECHT IN CIVITAS

Utrecht (Netherlands) participated in CIVITAS MIMOSA, an innovative collaboration between the cities of Bologna (Italy), Funchal (Portugal), Gdansk (Poland), Tallinn (Estonia), and Utrecht (Netherlands). The motto of the project is “Making Innovation in Mobility and Sustainable Actions.”

CIVITAS MIMOSA

With cities drawn from a range of geographical and economic situations, MIMOSA cities implemented a range of 69 activities, aimed at guaranteeing mobility to all citizens without burdening the environment or weakening the cities’ economy. Shaping a new mentality where conscientious behaviour is perceived as rewarding rather than a sacrifice was at its heart. This effort was reinforced by a host of technical and physical measures. It ran from 2008-2012.

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www.civitas.eu/display-all-projects



The electric Cargohopper delivery van

Introduction

Truck-based freight distribution is a major concern in Utrecht’s city centre. Road freight traffic contributes significantly to air pollution levels, particularly on busy delivery routes. Heavy vehicles damage historical infrastructure and create disturbance in the form of accidents, noise and air pollution.

Activities to reduce emissions from freight vehicles can be very effective. The city council, therefore, introduced a number of vehicle restrictions in the inner city, such as time windows for deliveries and a low-emission zone for trucks in 2007. This was extended to vans in 2013.

While the low-emission zone discourages the use of polluting vehicles, the deployment of cleaner vehicles can be stimulated through incentives, such as allowing particularly clean and quiet vehicles to carry out urban goods transport at night or by amending the exemption register to offer more relaxed transport conditions for urban distribution centres that operate extra clean vehicles.

Next to the low-emission zone and related restrictions, Utrecht defined five new ideas for sustainable freight traffic together with stakeholders:

- Flexible access for cleaner freight traffic;
- City distribution by boat;

- Merchandise pick up points;
- Construction logistics; and
- Distribution centres for bundling fresh and perishable food.

Utrecht has the ambitious policy to decrease the growth of the car use by 50 percent in 2030 and diminish the CO₂ emissions by at least 30 percent in 2020. Over 30 projects started under the umbrella of the policy ‘Utrecht Attractive and Accessible.’ Almost two thirds of these are CIVITAS measures. These activities to reduce emissions from road freight traffic, especially PM10 and NO_x emissions, are part of the Action Plan Air Quality and Ambition Document *Utrecht Attractive and Accessible 2025*.

Taking a closer look

Flexible access for cleaner freight traffic

This measure sought to reduce PM10 and NO_x emissions. Reduction were to be realised by the increase in numbers of sustainable freight vehicles and energy-efficient freight distribution.

In April 2009, an electric mini-train called Cargohopper appeared on the city’s streets. It was run by the same company that managed an urban distribution centre. The electric Cargohopper is a multi-trailer, 16-metre long, 1.25-metre wide, solar powered train. It has a maximum speed of 25 kilometres per hour and can transport the freight of five to eight vans.

The vehicle can drive eight to nine months a year on solar power. The other months it drives on green electricity. The Cargohopper is a fully CO₂ neutral form of freight transport.

2010 saw the introduction of a plan to implement cleaner freight traffic. The first step in the implementation was an inventory of the fuels that can be labelled ‘super clean’ and to which privileges could be given. The city’s participation in a national project on such vehicles resulted in new opportunities and ideas. Utrecht now allows freight deliveries during the night for clean and very quiet vehicles. Travel times and time savings for freight traffic using bus lanes were measured. As a result it was decided that a larger pilot should be conducted, to start in the course of 2013.

Particularly innovative in the context of Utrecht was the use of mini-trains on city streets and the increased access to restricted areas for clean/quiet vehicles.

City distribution by boat

Since good accessibility is crucial for the city’s economic viability, it was also decided to expand existing water transport with the introduction of a zero-emission, electrical vessel to deliver goods to shops, bars and restaurants in the city centre.



Delivering goods in the centre with the Cargohopper

Results

Flexible access for cleaner freight traffic

Impact evaluation of this measure was limited to the Cargohopper and gave the following results:

- Decrease of 4,080 vehicle trips;
- 88,332 kilometres saved by diesel van or light truck;
- Reduction of 5.8 tonnes of CO₂ (-73 percent), 0.005 tonnes NO_x (-27 percent) and 0.001 tonnes PM10 (-56 percent).

A cost/benefit analysis showed that the Cargohopper had a net present value of about EUR 65,000, which means it is cost-neutral for its lifespan. It also showed that the Cargohopper contributes to a reduction of emissions and noise pollution, as well as increased safety and overall liveability in the city centre. The service is also proving profitable for the operator.

City distribution by boat

The Beer Boat is currently operating six times per day, four days per week. It supplies more than 60 catering businesses. Market exploration showed opportunities to increase the volume of goods transported to current clients and two wholesale companies have shown interest in the service.

Introduction of a zero-emission vessel delivered immediate emission benefits. Figures reveal that 38 tonnes of CO₂, 31 kg of NO_x and 6 kg of PM10 emissions were saved during CIVITAS. As the Beer Boat has a longer life time, emission savings will continue in the future.

Implementation of the Beer Boat also has had immediate positive effects on air quality, noise, safety and overall liveability in the city centre. It does not damage the historical wharves, and has a positive effect on overall accessibility and inner city congestion.

A cost-benefit analysis was also conducted for the Beer Boat. It took a lifespan of 30 years into account and mainly focused on implementation and operating costs, revenues and emission effects. Overall, the boat is yielding a net present value of well over EUR 420,000 at a 3.5 percent discount rate.

Merchandise pick up points

The main results of the feasibility study on the merchandise pick-up points were not very positive and indicated that success was not

Since 2010, the Beer Boat has navigated Utrecht's canals. It got its name as the vessel initially transported beer and beverages to bars and restaurants along the canals. The first diesel-powered Beer Boat was launched in 1995 and was aimed solely at reducing damage to the old infrastructure. In 2007, the city became aware of the additional sustainability potential of transport by water combined with electric mobility. The result was the Beer Boat measure.

Following the launch of the more transport capacity became available. Not only did the new boat have greater capacity than the old vessel, but the old vessel also remained available for new customers. After the success of the electric Beer Boat, in the summer of 2011 the City of Utrecht signed a contract for another electric 'multi purpose vessel'. It replaced the existing garbage boat that had been collecting garbage from businesses on the wharves. In April 2012, the vessel, called the *Ecoboat*, was launched.

Merchandise pick up points

A merchandise pick-up point decouples the point-of-sale from the delivery location. Physically, it is an assembly point for goods, located just outside the city centre. It seeks to limit car traffic, as well as goods traffic, in the city centre, thus contributing to a reduction in the number of vehicles circulating. Shoppers can then collect their goods at any time, making it no longer necessary to use the car for shopping. The pick-up point can also be used as an urban distribution centre (UDC). National freight transporters drop their goods at the urban distribution centre and a local inner city distributor is responsible for the last transport stage.

Construction logistics plan

The central railway station area in Utrecht is being reconstructed between 2010 and 2019. With these infrastructural improvements, an increase in the flow of heavy construction traffic is anticipated. At the peak of construction activities, around 250 trucks would drive to and from the central railway station area every day. The city wished to implement logistics measures to prevent traffic jams and inconveniences for people living near the construction site and construction traffic routes, as well as people who use the public road.

Before the introduction of this measure, optimisation of urban construction logistics had been carried out in situations with only one major contractor. In Utrecht, there are multiple contractors who are technically independent from each other, yet at the same time interdependent since they are operating in the same restricted space. Within CIVITAS a new logistic organisation was established to address this challenge.

Distribution centres for bundling of fresh and perishable goods

Utrecht looked at the possibilities for freight logistics, especially for supplying catering businesses. In general, catering businesses have fewer suppliers, but more and smaller deliveries in a week. Logistics for catering businesses have very specific requirements. However, during implementation of this measure, it turned out to be difficult to gain support for a pilot and to find a good bundling partner. The measure was delayed and implementation was planned for a later date.



guaranteed. A prerequisite for success was a major change in the behaviour of consumers and retailers.

The conditions in Utrecht did not turn out to be very favourable. The number of stores that sell cumbersome goods in the city centre is low, as is the number of consumers that come to the city centre to buy such products. In general, retailers in Utrecht were satisfied with the distribution as it was. Following the results of the feasibility study and discussions with entrepreneurs in the second stage of the research, the decision was made to combine the pick-up point pilot with an existing bundling concept (www.binnenstadservice.nl). **Binnenstadservice** will begin operations in Utrecht from 2013. In principle, this is just a bundling concept of inbound and outbound goods, but if desired, a shopkeeper can derive benefit from additional services.

Construction logistics plan

One specific contractor and one transport company agreed on developing a construction logistics centre. The construction firms were actively approached and the benefits of cooperation were explained. At least one major construction firm is already actively involved in the construction logistics centre. Nevertheless during the project period the centre was not used: its success depends on the participation of different suppliers and the flow of (mainly smaller) construction materials. This is in turn dependant on the progress of the construction work around the central station.

In the future, implementation of this measure will continue. A building logistics plan has been developed for Utrecht and such conditions should be part of the contracts with construction firms.

Bundling of fresh and food deliveries

Research was conducted to identify freight logistics in this area and to see if there was support for a pilot project. It turned out that there was not much enthusiasm. Extra effort was put in convincing the entrepreneurs and finding a bundling partner, but implementation of the pilot was postponed.

Lessons learned

Flexible access for cleaner freight traffic

- Introduce the Cargohopper through an established transport company as it can

immediately replace existing delivery van transport. The ideal company should have an urban distribution centre.

- As freight transport and delivery regulations attract political discussion, an overall plan where different measures are included gives more continuity and consistency.
- It is recommended to include the different measures in one freight traffic plan to avert political discussions on every single measure.
- Changing freight transport is a step-by-step process. If an agreement on privileges for freight traffic exists at regional and national level, suppliers will be more likely to adapt.

City distribution by boat

The following barriers were encountered during the implementation of the Beer Boat:

- Many lighter goods flows can be handled perfectly by road transport within weight and delivery time restrictions. Restrictions on heavier goods and flows are heavily affected by the time windows, thus favouring the Beer Boat.
- It is a challenge to find interested transport companies and suppliers, as transporters do not easily change their actual schemes and delivery profiles. Logistical choices for chain stores are often made at their headquarters and implemented nationwide. A specific logistic solution for one city is often considered too difficult to incorporate.
- Some transport companies had already adapted to delivery restrictions or had made investments in their delivery chain involving truck delivery. For them, this makes the Beer Boat financially unattractive. The solution to this would be to approach these companies during periods when they are reconsidering their logistical or equipment choices.
- As many clients can only accept/dispatch deliveries at certain times, the Beer Boat delivery route and schedule can be inefficient. It often has long waits and repeated trips due to inconsistent availability of staff at neighbouring catering business.

The following incentives for the Beer Boat emerged:

- Truck based deliveries are constrained in terms of timing and weight restrictions, creating a



City distribution by boat

favourable framework for the development of the boat's services.

- Larger suppliers, transport companies and chain stores make more rational cost-and environment related decisions, which should favour the boat services over truck delivery. Also in general, larger companies have larger goods flows, which are usually more viable for waterborne transport

The Beer Boat performs best in a compact infrastructure, with a dense distribution of clients along the canals.

Merchandise Pick up points

- Make the merchandise pick-up point attractive for retailers;
- Look for opportunities to combine with existing service(s), such as a bundling concept;
- Start with a small extension of an existing concept and build it up step-by-step;



- Search for related pilots to make it more attractive for shopkeepers and consumers. This will be much more appealing than only one small standalone pilot.

Construction logistics

During the implementation of the measure the following barriers were encountered:

- Limited problem awareness with construction companies and, therefore, the willingness to participate in a construction logistics plan or use is low.
- Reluctance for strict regulations on private companies concerning construction logistics.
- Delays in building projects affect the flow of construction materials, which impacts the performance of the centre.

Distribution centres for bundling fresh and perishable food

The following barriers were identified:

- Smaller companies see several barriers in the concept. These include the changed nature of the relationship between customer and supplier, mistrust between small and bigger suppliers and the loss of control on fresh goods.
- Often orderings are made late in the evening for delivery in the following morning, which creates inefficiencies.
- Transport costs are not visible, as these are included in the product price.
- Suppliers are often ready to make an extra trip, in case of incomplete deliveries.

Given that there are few good examples of bundling fresh goods and the fact that catering businesses have more urgent economic worries, they hold the view that delivery regulations are the responsibility of the municipality.

The following recommendations have been identified:

- Start with a larger pilot area as some entrepreneurs have more businesses in different parts of the city and most suppliers have many deliveries to make on one trip.
- Organise cross-docking via a transporter instead of a wholesaler. In the Netherlands, transporting via a wholesaler for other suppliers is legally difficult to arrange.

- Identify frontrunners who can convince others to join.
- Take into account that changing habits takes time, especially as entrepreneurs view change as costly.

Upscaling and transferability

Since the action plan contains measures and innovations till 2015, a longer term implementation is planned. Thanks to the publicity received through CIVITAS, results have been and will continue to be shared throughout Europe. Utrecht won the in 2011 the CIVITAS Technical Award for their sustainable approach of Freight Traffic and was the best CIVITAS City in 2011. With this Award, Utrecht benefitted from worldwide exposure and interest in its approach.

In 2012, Utrecht organised a study tour on sustainable freight traffic to exchange ideas with other cities in Europe. This saw the participation of 25 participants from Sweden, Norway, Belgium, the United Kingdom, Denmark and Italy. Participants could hear, feel and experience the sustainable freight traffic approach in Utrecht.

Utrecht was given credit and acknowledgement for its investments and leading position in the area of sustainable solutions for logistics by winning the Green and Lean Award, given by Connekt. By receiving the award, the city of Utrecht is now appointed as one of the frontrunners for sustainable mobility in the Netherlands.

Winning the National Lean and Green Award 2011 and the National Distribution Award 2009 gave a further boost in the promotion of the measures and results. Various Dutch cities have started to copy some of Utrecht's most successful measures.

Budget and Finances

Optimal measure integration has been demonstrated by Utrecht's ambitious Action Plan for Sustainable Freight Traffic. The Plan's mission is to bundle, innovate and optimise freight traffic in Utrecht and make it greener. It details a list of interlinking measures, some mentioned above. The city made EUR23 million available to enable this integral package of measures and technical innovations.

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References or sources

<http://civitas.eu/content/utrecht>



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