



Commercial Transport in European Cities

How do European cities meet the challenges of commercial transport?

Experiences and case studies from the CIVTAS Programme of the European Commission

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Berlin, Juli 2008

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Vorwort

Die vorliegende Veröffentlichung ist ein Ergebnis der Zusammenarbeit zwischen dem Städtenetzwerk Metropolis und dem Fachgebiet Integrierte Verkehrsplanung im Jahr 2008. In Vorbereitung des Metropolis Weltkongresses verbunden mit der jährlichen Konferenz der Kommission 4 ‚Urban Mobility Management‘ des Netzwerkes wurde durch das Fachgebiet Integrierte Verkehrsplanung ein Überblick zum Schwerpunktthema ‚Wirtschaftsverkehr in europäischen Städten‘ erstellt. Dieser Überblick dient als Input und Anregung für die internationale Konferenz ‚Urban commercial transport‘, die im Oktober 2008 in Sydney stattfindet und vom Metropolis Städtenetzwerk zusammen mit der Senatsverwaltung für Stadtentwicklung Berlin, der Stadt Sydney und dem Fachgebiet Integrierte Verkehrsplanung organisiert und durchgeführt wird.

Hierbei wurde drei zentralen Fragen nachgegangen, deren Beantwortung Planern in Städten Denkanstöße für die eigene Arbeit liefern sollen: ‚wie stellen sich europäische Städte den Herausforderungen des städtischen Wirtschaftsverkehrs?‘, ‚welche Erfahrungen gibt es?‘ und ‚können zur Verdeutlichung von Vorgehensweisen und Sachverhalten Fallstudien aufgeführt werden?‘

Das Dokument basiert auf den Erfahrungen, die in einem weltweit einmaligem verkehrspolitischen Unterstützungsprogramm gemacht werden und wurden. Die CIVITAS Initiative der Europäischen Union, mit der innovative städtische Verkehrskonzepte gefördert werden, ist eine wertvolle Quelle der praktischen Stadtverkehrsplanung. Die Bemühungen der im Programm teilnehmenden Städte sind ein reichhaltiger Fundus und geben einen hervorragenden Überblick über Anwendungskonzepte und Lernprozesse, über das was in der Praxis funktionieren und was nicht funktionieren kann, und schließlich zeigen sie die Schwachstellen im Wissen über Wirtschaftsverkehr auf. Die in den CIVITAS Städten gesammelten Erfahrungen sind besonders für Städte in entwickelten Ländern eine hervorragende Chance voneinander zu lernen.

Der Beitrag ist in vier Kapitel gegliedert. Das erste Kapitel stellt kurz die Bedeutung und Rolle des Wirtschaftsverkehrs und der CIVITAS Initiative dar. Im zweiten Kapitel werden einige Definitionen und Grundlagen, die für den Überblick über Wirtschaftsverkehr in europäischen Städten bedeutsam sind, dargelegt. Das dritte Kapitel fasst die Ergebnisse des Überblicks zusammen und erklärt die drei wichtigsten Handlungskonzepte für städtischen Wirtschaftsverkehr, die in der Praxis der CIVITAS Städte angewendet werden:

- i) das Konzept des intelligenten Einsatzes von Wirtschaftsverkehrsfahrzeugen;
- ii) das Konzept der sauberen Fahrzeugtechnologie, und
- iii) das Konzept der Anreize/Belohnungen

Kurzprofile der durchgeführten und geplanten Maßnahmen und stadtorientierte Übersichten legen die verkehrsplanerischen Ansätze auf einen Blick dar.

Das vierte Kapitel ist die ‚Erfahrungs-Bibliothek‘ in der die vielfältigen Maßnahmen der CIVITAS Städte, die sich der Herausforderung Wirtschaftsverkehr stellen zusammen getragen wurden. Auf der Grundlage der so genannten Maßnahmenblätter, die auf den CIVITAS Internetseiten zur Verfügung stehen werden 47 Fallbeispiele aufgeführt und in einer Art Informationsblätter beschrieben, die die Maßnahmenbeschreibung, Ziele, Umsetzung, Ergebnisse und was aus der Arbeit gelernt wurde enthalten.

Hans – Joachim Becker und Diana Runge

Berlin im Juni 2008

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1 Introduction

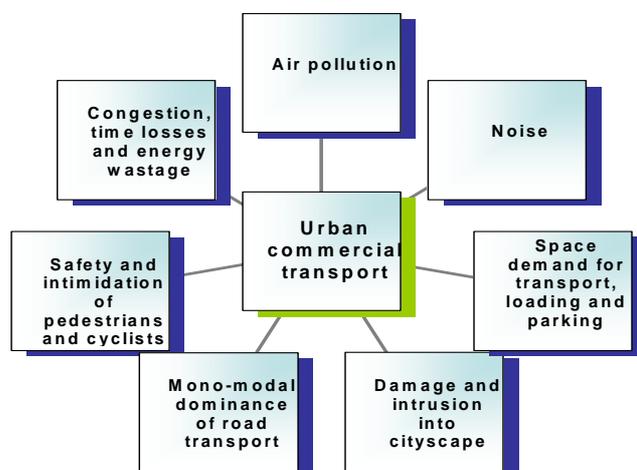
The EC's Fourth and Fifth Framework Programmes included projects addressing urban commercial transport issues. The CIVITAS-Initiative as part of these Programmes funded in more than 20 European cities urban freight measures. The report on hand is a review of urban commercial transport measures implemented in cities participating in the CIVITAS-Initiative. This document should be understood as a contribution to the manifold activities undertaken in the area of urban commercial transport, presenting issues concerning the implementation process. It aims to assist the discussion and refinement process on sustainable urban transport planning by providing an overview on the efforts made, results achieved, obstacles experienced and lessons learnt in European cities when addressing matters relating to commercial transport. The document should serve as a source of information for all actors involved in implementing urban transport strategies and measures.

1.1 Why to deal with commercial transport?

About 80% of the population in Europe lives in urban areas, consequently industrial production, processing and service provision are also concentrated to a high degree in urban areas. Furthermore, the international and national division of labour, changes in goods demand, logistics and supply chain trends all contribute to the changing role of urban commercial transport.

Commercial transport covers a broad spectrum of transport activities. It is related to both delivery and collection activities for retail industry, transport of equipment and materials for the construction industry, waste transport, and services such as collection and delivery of parcels and courier services. In some cities commercial transport takes up about 30% of the traffic volume already. Commercial transport in European cities has increased dramatically in the past decades and an increase of environmental burdens, such as noise, pollution and accidents came along with this development. Moreover, commercial transport vehicles demand increasingly space for delivery and parking in the cities, they compete with other mobility groups, they cause congestions and they themselves raise obstacles making distribution of goods and services less efficient.

Graph 1 : urban commercial transport related obstacles



Source: modified graph from BESTUFS (2005): Best Practise Handbook Year 2005; BESTUFS

A wide range of strategies and measures are applied in cities to tackle those problems. Clean vehicle technologies, urban distribution centres, integrated urban freight planning, loading schemes, travel information, access restrictions and fleet management are some of the concepts that cities deal with to lessen the environmental impacts and improve the efficiency of the commercial transport.

In Europe innovative and promising solutions for urban commercial transport have been applied in the last decade in various cities and countries (e.g. Belgium, Finland, France, Germany, Italy, The Netherlands, Spain, Switzerland and UK). Outstanding, however, are the efforts made in 20 cities that have been promoted by the European Commission under the CIVITAS-Initiative.

1.2 What is the CIVITAS Initiative?

CIVITAS 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.'¹

CIVITAS I started in early 2002 (within the 5th Framework Research Programme); CIVITAS II continued the approach in early 2005 (within the 6th Framework Research Programme).

Within CIVITAS I (2002-2006) 19 cities were clustered in 4 demonstration projects, whilst within CIVITAS II (2005-2009) 17 cities take part in 4 demonstration projects. These 36 cities all over Europe (see Map 1) are funded by the EU with 100 million €, and the overall budget of the Initiative will be more than 300 million €.

In 2008 a third phase is about to start, CIVITAS PLUS. Additional 23 cities will participate and thus the number of cities of the CIVITAS family will increase to 59.

1.3 Why to deal with CIVITAS cities?

The CIVITAS Initiative promotes innovative urban transport approaches in cities. The planned urban transport measures in the cities cover a broad range of transport issues within the fields of mass transport and commercial transport. However, the cities differ in economic structure and functions, social composition, population size and demographic structure as well as geographical location. This heterogeneity strongly influences urban development processes and therefore the urban transport policies including urban commercial transport policies. Consequently the cities vary in mobility data such as modal split shares, transport demand for mass and commercial transport and time-based distribution of transport, requesting different solutions for the specific situation in the cities.

The efforts made by the CIVITAS cities in the field of commercial transport are a priceless advantage for cities especially in developed countries. The efforts give an outstanding overview about

- current approaches applied in the cities,
- the learning processes within the cities,
- what works and what does not work in these cities, and finally
- it indicates the current knowledge gaps.

¹ Source: http://www.civitas-initiative.org/cms_pages.phtml?id=348&lan=en&PHPSESSID=6da360c157cfef88c46ca57fe09b27f5

The experiences made within the CIVITAS Initiative are an excellent chance to learn from these cities in terms of gaining food for thought.

Many of the information on the measures dealing with commercial transport are available on the CIVITAS website: <http://www.civitas-initiative.org>.

Map 1: CIVITAS cities



Source: http://www.civitas-initiative.org/city_map.phtml?lan=en

1.4 Structure of the report

The review at hand consists of four chapters. The [first chapter](#) outlines ‘why to deal with urban commercial transport?’ and explains the CIVITAS-Initiative.

The [second chapter](#) provides some definitions and basics on urban commercial transport.

The [third chapter](#) summarises the results of the review and explains three approaches applied in the European cities to meet the challenges regarding commercial transport:

- i) the intelligent commercial vehicle use approach;
- ii) the clean vehicle technology approach; and
- iii) the incentives approach.

The main characteristics of the implemented and planned measures are presented at a glance. Furthermore, an overview about the cities, the measures and strategies applied to abate the negative impacts of commercial transport are outlined.

The [forth chapter](#) provides detailed facts on the experiences made by the cities. 47 measures implemented and planned within the CIVITAS programme are outlined in information sheets, presenting the measure description, the objectives, the implementation process, results and lessons learnt.

2 Basics and definitions on urban commercial transport

There are various terms used within the field of commercial transport. In the following terms relevant for this review are explained.

Urban commercial transport

In this review commercial transport is defined as transport activities related to both collection and delivery activities in retailing industry, transport of equipment and materials for the construction industry, waste transport and a broad range of other transport activities such as parcel and courier services.

Measures for commercial vehicle access and loading/unloading in urban areas

The access of commercial vehicles to urban areas and the loading/unloading activities of freight vehicles in urban areas can be regulated and steered using different strategies and instruments. There are many ways to classify measures into strategies². However, established classifications differentiate between technical (e.g. vehicle technology, telematics applications), organisational (e.g. co-operation, consolidation), planning (e.g. route planning), operational (e.g. night delivery) and political (e.g. environmental zones, time windows, weight limits) solutions. Table 1 presents the most common measures for access and loading.

Table 1 : Common urban commercial transport measures

Category	Measure
Planning	Lorry routes
	Lorry lanes
	On-Street loading bays
Information	Urban freight information and maps
	Signing
Organisational	Nearby delivery area (Espace de livraison de proximité - ELP)
	Urban consolidation centres
Political (regulations)	Vehicle weight and size regulations
	Time regulations
	Imposing and enforcing access and loading regulations
	Environmental zones/ emission standard regulations
	Road charging systems
Operational	Night delivery

Urban distribution / consolidation centre

The term urban consolidation centres has several different meanings, and different terms have been used in European countries to denote this type of facility. Table 2 provides an overview of different terms in use.

According to BESTUFS Good practices guide on urban freight transport (2007) an Urban Consolidation Centre is defined as follows: "A logistics facility situated in relatively close proximity to the geographic area that it serves (be that a city centre, an entire town or a

² e.g. VISSER/van BINSBERGEN/NEMOTO (1999) mention among others the following strategies: Network, parking and loading, licensing and regulation, pricing or information, terminal and modal interface facilities strategies

specific site such as a shopping centre), to which many logistics companies deliver goods destined for the area, from which consolidated deliveries are carried out within that area, in which a range of other value-added logistics and retail services can be provided.”

However, three different types of Urban Consolidated Centres (UCC) are common:

Area related UCC - it serves a city. The geographical area served may vary from a specific retail area, a city centre to an entire city. The number of companies operating the centre can vary from a single company to several companies.

UCC on single sites with one landlord – it serves a mayor customer such as airports, shopping centres.

Special project UCC – it serves a single site (e.g. construction site) and delivers non-retail products (e.g. construction material). The UCC serves over a specific period of time and accompanies a project such as construction work.³

Table 2 : Terms used to label consolidation centre

Facility to consolidate goods	public distribution depot
	central goods sorting point
	urban transshipment centre
	shared-user urban transshipment depot
	freight platforms
	cooperative delivery system
	consolidation centre (sometimes specific, e.g. retail, construction)
	urban distribution centre
	city logistics (or city logistik) schemes
	logistics centre
	pick-up drop-off location
	offsite logistics support concept
	freight village.

Environmental zone

There are various terms to identify zones that can be entered only by vehicles meeting certain emission criteria: i) Low Emission Zone (LEZ); ii) Environmental Zone; iii) Clean Area. Time, vehicle emission standard and vehicle type related criteria are common to regulate who can enter the area and who can not.

Access regulations

Access regulations are regulations for all types of commercial transport vehicles in the access to certain areas, zones especially inner cities. The purpose of these regulations is to reduce the negative effects in the specific area caused by the commercial vehicles.

Last mile / home deliveries

Last mile solutions are specific logistic solutions custom-tailored for remote sale business. It is often referred to as home deliveries and includes e-commerce purchase and other remote purchases such as mail order, direct selling and television shopping. Deliveries may be made

³ more information on urban consolidation centre see: BESTUFS Good practices guide on urban freight transport (2007)

to different places such as customer’s home, customer’s place of employment, reception/delivery boxes, collection points or locker banks⁴.

Waste transport

Waste transport is an often overlooked aspect of urban commercial transport. Economic development and accession of wealth is accompanied by increased production and consumption and results in growth of waste. Especially the shorter lifecycle of products and the packaging of products contribute to the increase of waste.

Waste can be classified regarding different aspects. For urban commercial transport purposes the consideration of municipal waste is important: municipal waste means waste from households, all sectors of industry and institutions, which because of its nature and composition is similar to waste from households.⁵

3 Summary

3.1 Commercial transport strategies, measures and approaches applied in CIVITAS cities

Within the CIVITAS-Initiative twenty cities got together to face the challenge of dealing with commercial transport. In order to meet the specific local conditions and cope with the problems caused by commercial transport the cities searched for appropriate solutions. The result is a surprisingly broad spectrum of strategies and measures indicating the complexity and variety of the urban commercial transport in European cities. A total of 47 measures could be identified, that have been applied by the 20 cities. These measures can be merged into three main approaches, nine strategic areas and eleven strategies (see Table 3 and Graph 2).

Table 3: Commercial transport strategies, measures and approaches applied in CIVITAS cities

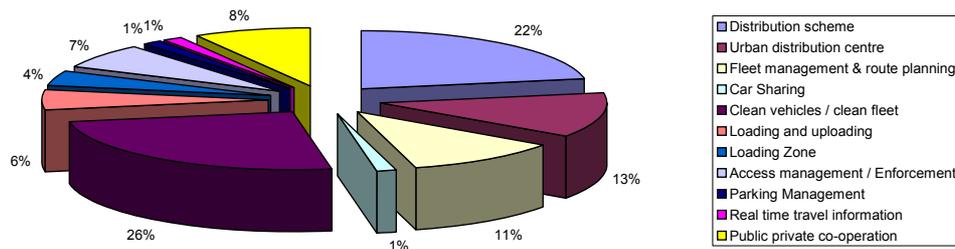
Approach	Intelligent use of vehicles			Clean Vehicle technology	Incentives			Others				
Strategic areas	Distribution	Fleet	Car sharing	Clean vehicles	Loading	Access	Parking	travel information	PPP	Mobility management		
Strategy	Distribution scheme	Urban distribution centre	Fleet management & route planning	Car sharing	Clean vehicles / clean fleet	Loading and unloading	Loading Zone	Access management / Enforcement	Parking Management	Real time travel information	Public private co-operation	Eco Driving

⁴ more information on ‘last mile’ issues see: BESTUFS (2007): Good Practice Guide on Urban Freight Transport

⁵ more information on waste transport see: ABEL, H. /KARRER, R. (2005): Best Practise Handbook Year 2005; BESTUFS

To put it in a nutshell the various efforts made by the cities can be outlined in accordance with three wider approaches - the intelligent use of vehicles approach, the vehicle technology approach and the incentives approach. The interesting point is that cities put less emphasis on technology but rather on looking for solutions that answer the questions 'how to organise commercial transport in a more efficient way?' and 'which incentives might contribute to reduce commercial transport side effects?'. Furthermore, in order to increase the generated effects, many cities apply a bundle of measures and, in order to achieve synergy effects, they combine within a measure different strategies e.g. distribution centre and clean vehicles.

Graph 2 : Commercial transport strategies in CIVITAS cities



3.1.1 The intelligent commercial vehicle use approach

The approach that has been applied most by the cities is the intelligent vehicle use approach. It combines the three strategic areas 'distribution', 'fleet management' and 'car sharing'. More than one third of the measures in the cities aimed to reduce the number of vehicles in circulation, number of supply trips, mileage and transport related air pollutant emissions and noise by establishing distribution schemes and centres. In addition to this 'collective approach' the 'individual approach' of fleet management has been applied as well. Furthermore some cities identified 'sharing delivery vehicles' as a solution to reduce the number of vehicles in circulation. Since all three strategies share a common agenda it seems that cities pin their hopes on intelligent use of vehicles to solve commercial transport problems. All in all nearly 50 % of the solutions are related to this intelligent use of vehicles approach.

3.1.2 The clean vehicle technology approach

A second focus can be called the clean vehicle technology approach. Cities would like to see quick and direct improvements by introducing clean vehicles and clean fleets. About one quarter of the measures aims to improve the negative environmental impact by using clean vehicles.

3.1.3 The incentives approach

A third focus can be called the incentives approach. Cities applied incentives or restrictions related measures to solve special problems, such as loading, unloading, access and parking of the commercial transport. Delivery companies that fulfil certain requirements are rewarded with preferential treatment. About one fifth of the measures aim to improve local delivery conditions.

3.1.4 Others

Solutions related to information technologies do not play a major role among the CIVITAS cities. The car sharing approach aims predominately at business trips of people and less on sharing delivery vehicles. The public-private co-operation seems to be an interesting approach to solve commercial transport issues.

3.2 How does the 'Intelligent commercial vehicle use approach' work?

The approach combines the three strategies 'distribution', 'fleet management' and 'car sharing'. The following section provides a condensed overview about implemented and planned measures in the CIVITAS cities.

3.2.1 Distribution strategies

Distribution strategies are embraced by different terms such as consolidated, co-ordinated and optimised delivery or distribution scheme, distribution or consolidation centre as well as city logistic. They all aim to reduce the number of vehicles in circulation, the mileage, the fuel consumption and harmful emissions.

The implemented distribution approaches use very often combined approaches to reach synergies and to support the main strategy with accompanying activities such as loading/unloading issues, clean vehicle employment, multi-use lanes, regulations and communication and information activities.

The main focus is on the delivery of any kind of goods needed for retail and whole saleing. There are a few exemptions serving special clients – offices with office materials, restaurants and cafeterias with food goods. Consolidation centres and delivery schemes seem to be an appropriate solution.

The last mile approach seems to be a difficult approach and is sometimes treated with the term value added service. The starting point for the project in Rotterdam was to improve purchase and carriage of purchased goods by providing distributional portals at strategic locations. The starting point for the project in Winchester was to improve home deliveries. Both projects could not succeed due to specific conditions to be considered and unfavourable framework conditions.

Although construction works shape the cities and the urban transport, the related logistic challenges do not appear on the agenda of the cities. Only Stockholm took up the issue of construction related logistic and showed options how to solve site transport problems.

A complete innovative way of tackling freight transport is to replace vehicle transport by underground pipe systems. Target group for this approach is mainly the 'business to business' with goods to be stored or processed, especially chemicals, oil and gas.

Measure characteristics of implemented distribution strategies⁶

Barcelona

Combined approach with emphasis on distribution scheme, unloading and loading zone elements and quiet vehicles. Five super markets sites have been supplied with night-time deliveries with a 40 ton truck for quiet and off-peak deliveries. Furthermore, the multi-use lane which converts on-street parking space into unloading zones has been expanded, web-based loading information (active guide) has been provided and kerbside regulations have been established. Traffic conditions and accessibility of customers have been improved and delivery time has been reduced dramatically.

Bremen

Combined approach with emphasis on city logistic and clean vehicles. The main delivery element is the consolidation of goods delivery for so-called difficult inner-city areas and special clients such as shopping centre, the city centre, warehouses and retailers with special requirements. Positive effects have been gained regarding mileage reduction (9,000 kilometre per month), fuel savings (1,100 litre diesel per month) and emission reduction. Consolidation related difficulties (composition of co-operation partners, grouping of deliveries, competition with courier, express and parcel services) and non-availability of freight vehicle technology have reduced the success of the combined approach.

Berlin (two measures applied)

- Combined approach with emphasis on urban distribution centre and GPS based container tracking system.
- Combined approach with emphasis on urban distribution centre and clean vehicles. A communication strategy was used to inform haulage companies on possibilities of purchasing CNG-powered lorries.

Bristol

Co-operative city logistic approach for city centre with 53 participating companies; consolidation of goods delivery to drop point boxes and exchange of information in a freight forum (Freight Quality partnership). Remarkable reduction of freight vehicle movements (50% and more), mileage (1,000 kilometre per month) and harmful emissions could be achieved.

Göteborg (two measures applied)

- Combined approach with emphasis on load factor and distribution centre. The excellent relationship between administration and companies made it possible to test criteria for load rate, to test information options and to test different incentive for companies meeting the criteria. An easy to apply digital pen for reporting was successful introduced. Good communication and incentives such as loading zones, multi use lanes are success factors for this type of approach.
- Area based logistic approach; coordinated delivery of goods (office material) with 15 companies and 5 suppliers. Positive effects regarding frequency of deliveries – changed purchase routines and changed delivery behaviour (on average a reduction of 41% or 500 deliveries per year), economic benefit for suppliers and reduced environmental impact.

Graz

Combined approach with emphasis on distribution scheme and fleet management. Two main elements form the logistic approach: i) consolidated daily goods delivery for a shopping centre (shop-in-shop centre); and ii) application of small electric distribution vehicles. The number of vehicle kilometres has been reduced by 56% with a corresponding reduction of

⁶ The measure characteristics summaries for each relevant city the measures applied within the distribution strategy

emissions and energy use. The noise levels did not change because the number of participating companies was small. A 'city marketing company' was founded open to all companies.

Rotterdam (two measures applied)

- Alternative technology approach with emphasis on replacing road transport by operating a system of underground tube transport (multi-core tube logistic). The impact of indicators related to society, energy, transport, environment and economy is either neutral or positive. Energy efficiency impact is positive but modal shift and noise impact are limited.
- Last-mile approach with emphasis on e-commerce logistics. The approach should serve 'business to business' and 'business to consumer' establishing eight distribution portals at strategic locations for public transport, Park and Ride facilities and private transport. The project was not successful due to the slow process of obtaining permits, financing problems and the general unfavourable economic climate in the Netherlands during implementation.

Stockholm (two measures applied)

- Combined approach with emphasis on urban distribution centre and clean vehicles. The special customer structure, restaurants, requested for specific solutions. The existence of the logistic centre has reduced the number of deliveries. A reduced number of trips in combination with the use of a more environmentally friendly fuel reduced the emission from deliveries in the demonstration area. Annual fossil CO₂ emissions were reduced by 1.3 tonnes CO₂/year, NO_x emissions by 0,019 tonnes NO_x/year, particulate matter by 1.91 kg/year, and finally energy were saved to an amount of 7.0 GJ/Year.
- Construction material logistic approach with three components i) Co-transportation of goods, ii) Temporary material storage, and iii) Smart traffic guidance system. Annual fossil CO₂ emissions were saved by 110 tonnes CO₂/year, NO_x emissions by 500 tonnes NO_x/year, particulate matter by 0.012 PM (Kg)/year, and energy were saved to an amount of 1,5 TJ/Year.

Winchester

Combined approach with emphasis on home deliveries, freight map and waste recycling scheme. The home delivery scheme was not successful. The recycling scheme could establish the service collecting especially packaging material from more than 35 clients.

Measure characteristics of planned distribution strategies⁷

Burgos

Combined approach with emphasis on optimised delivery, unloading, access management and clean vehicles. The main elements of improved deliveries are optimisation of delivery and distribution schedules, new concepts for the management of deliveries and use of information technology.

Genova

Combined approach with emphasis on distribution centre, access management and car sharing. A so called 'tool box approach' is envisaged, using a series of instruments in a coordinate way such as small proximity warehouses, van sharing and access regulations.

Krakow

Combined approach with emphasis on a new scheme of goods distribution and employment of clean and more environment friendly vehicles.

⁷ The measure characteristics summaries for each relevant city the measures planned within the distribution strategy

La Rochelle (three measures planned)

- Combined approach with emphasis on city logistic and clean vehicles. The expansion of the existing city logistic will be based on a tool box approach (clean vehicles, delivery zones, freight networks, regulations, public-private co-operation).
- Added value approach with emphasis on new services. This could be recycling of packaging; delivering goods at P+R; delivering fresh vegetables and fruit, fish from outside wholesale markets; providing goods transport inside towns between trades (ex dry cleaner and restaurants, flower shop and individuals); transport individual customers from hyper or super markets by bus.
- Communication and co-operation approach including all actors in city logistic to foster co-operation between all actors, to strengthen shift to clean deliveries.

Malmö

Communication and co-operation approach establishing a food logistic market place with 50 food producers and 5 distributors using open source logistic system.

Norwich (two measures planned)

- Combined approach with emphasis on urban distribution centre, clean vehicles and public private partnership. An urban transshipment centre for freight deliveries and collections with clean and energy efficient goods vehicles within the city centre will be established.
- Combined approach with emphasis on distribution scheme approach, provision of timely delivery of goods, clean urban delivery vehicles and a last-mile approach from a city centre retail complex to a suburban Park&Ride terminal, where the retail goods purchased earlier in the day can be collected by the consumer.

Ploiesti

Combined approach with emphasis on city logistic scheme and public private partnership. The elaboration of a city logistic strategic plan, selection and signing of freight routes and establishment of a freight forum is planned.

Preston

Combined approach with emphasis on city logistic scheme, freight forum. Based on a strategic plan for city logistics delivery zones will be defined, freight routes will be selected and equipped with signage and a website with a freight map will be established.

Toulouse

Combined approach with emphasis on urban distribution centre, public private co-operation and distribution scheme.

3.2.2 Fleet management strategies

There are no specific fleet management strategies implemented, but as mentioned already they are often combined with other strategies. Cities under the CIVITAS II programme plan to implement a number of fleet management related measure.

Measure characteristics of planned fleet management strategies⁸

Malmö (two measures planned)

- Technology approach installing vehicle computers at 100 heavy trucks of the Malmö Lorry Centre in order to improve management of the fleet especially reduction of un-loaded trips.
- Technology approach with emphasis on GPS (satellite) and GPRS (mobile phones) techniques managing 'unplanned' city distribution especially for SME.

Norwich

Combined approach with emphasis on public private co-operation, fleet management and clean vehicles based on freight holders club, transshipment centre and electronic platform.

Venice

Combined approach with emphasis on fleet management and loading aspects for water based transport. A web-based information system for the management of limited number of docks will be introduced.

3.3 How does the 'clean vehicle technology approach' work?

The clean vehicle technology approach covers different types of commercial vehicles especially delivery vehicles such as heavy duty vehicles, medium and small trucks, vans and small distribution vehicles for specific requirements. The disposal issue and related transport problem is taken up by a few cities looking for clean and quiet solution. The clean/green vehicles are mainly gas (compressed natural gas and compressed biogas) and electric driven vehicles.

3.3.1 Clean vehicles strategies

As mentioned before often cities combine strategies so that pure technology measures are rare.

Measure characteristics of implemented clean vehicle technology strategies⁹

Rotterdam

Clean vehicle approach with emphasis on electric distribution vehicles. Technical problems especially malfunction of the battery management system prevailed and limited the successful use of the vehicles.

Stockholm

Technology approach with emphasis on promotion of biogas powered heavy vehicles. 24 clean heavy vehicles were purchased. (21 biogas buses and 3 biogas lorries). The consumption of fossil energy has been reduced by 20,984,412 MJ per year. The emission of fossil CO₂ has been reduced by 86% equals 1,329 tons per year. Emissions of NO_x, particles and CO have been reduced by 50%. However the emissions of HC have increased by 20 times.

⁸ The measure characteristics summaries for each relevant city the measures planned within the fleet management strategy

⁹ The measure characteristics summaries for each relevant city the measures applied within the clean vehicle technology strategy

Berlin (two measures implemented)

- Clean vehicle approach using information and incentive elements. More than 140 small and medium size delivery vehicles have been supplied. The success was limited by the fact that the procurement of heavy CNG-lorries is very difficult because of missing market offers.
- Combined approach with emphasis on financing of clean vehicles and public private co-operation. New financing models have been elaborated and communicated.

Göteborg

Combined approach with emphasis on co-operation and incentive elements. A energy supplier and three logistic companies tested different incentive options to change from conventional distribution to new environmentally friendly ways of distribution. These included provision of subsidies, improving fuel supply infrastructure and green tonnage service. 16 distribution vehicles and 2 heavy duty vehicles contributed to a reduction of CO₂ emissions by 72.8 tons and NO_x by 83 kg. The vehicles will within 1 year's time drive app 500,000 km on CBG instead of diesel.

Measure characteristics of planned clean vehicle technology strategies¹⁰**Malmö**

Combined approach of replacement of diesel vehicles by natural gas vehicles with CO₂ cooler and training of drivers in eco driving.

Norwich

Incentive oriented approach allowing goods vehicles, which meet pre-determined clean vehicle standards, to use collective transport priority lanes.

3.3.2 Waste collection vehicles**Measure characteristics of implemented waste collection vehicle strategies¹¹****Göteborg**

Clean waste collection approach with CNG/CBG technology. 4 clean vehicles have been purchased and tested. The cost of the clean vehicle is higher compared to a conventional waste collection vehicle, but fuel consumption is reduced by 49 % and the consumption of electricity is 2 kWh/ton collected waste. In addition the emissions have decreased with 50 - 65% (PM, CO, NO_x and CO₂) and by 9 % for (HC) and the clean vehicles perform on significant lower noise level.

Stockholm

Clean waste collection vehicle approach with emphasis on biogas technology. 8 waste collection vehicles have been purchased. The cost of the biogas vehicle is approximately 30% higher compared to a conventional waste collection lorry. The high fuel consumption of biogas is explained by the relatively low efficiency of the Otto engine at times when the load is light.

¹⁰ The measure characteristics summaries for each relevant city the measures planned within the clean vehicle technology strategy

¹¹ The measure characteristics summaries for each relevant city the measures applied with the waste collection vehicle strategy

Rotterdam

Clean waste collection vehicle approach with emphasis on filter technology. Due to filter performance problems the waste vehicles could not be equipped with the filters. Due to the high price of a new developed active filter system only two waste collection vehicles could test the system. Instead 20 small sweeping vehicles have been successfully equipped with catalytic particulate oxidizer filters. A reduction of particles between 5 and 25% and a strong reduction of CO (90%) and VOC (60%) could be attained.

3.4 How does the 'incentive approach' work?

The incentive approach aims to improve local delivery conditions and addresses access regulation for environmental zones, clean zones, loading and unloading issues and parking of heavy duty vehicles. Some cities introduced environmental zones in the past and the experiences made supported the expansion of those zones.

3.4.1 Access strategies

The access strategies applied in the cities deal predominantly with environmental zones.

Measure characteristics of access strategies¹²**Göteborg**

Expansion of the existing environmental zone. New criteria and regulations have been elaborated based on field tests.

Prague

Expansion of the existing environmental zone. The environmental zone has been widened as planned and emissions, noise and energy consumption have been reduced and the attractiveness of the city centre has increased.

Rotterdam

Dialogue oriented approach with emphasis on creation of a network for regional freight transport.

Stockholm

Expansion of the existing environmental zone combined with information strategies.

A reduction of annual fossil CO₂ emissions by 300 tonnes CO₂ /year, NO_x emissions by 30 tonnes NO_x/year, particulate matter by 0.4 tonnes PM/year and energy by 2 TJ/year could be achieved. The rules for environmental zones have been followed strictly.

Malmö

Malmö is the only city under the CIVITAS II programme to extend the existing environmental zone: Combination of extending the existing environmental zone and enforcement activities.

¹² The measure characteristics summaries for each relevant city the measures applied within the access strategy

3.4.2 Parking strategies

The special issue of heavy duty parking in the cities is taken up by Rotterdam with a high volume of vehicles due to the transport activities of the port.

Measure characteristics of parking strategies¹³

Rotterdam

Parking management approach providing parking space for 60 trucks. Prevention of long term parking of truck-combinations in residential quarters. In 2004 about 10.000 trucks parked at the facility and the average occupancy rate was between 50 and 60%. Peak noise burden has shifted from populated to less populated areas.

3.5 Cities and synergies

In order to increase effects a number of cities apply a bundle of measures. In cases one individual measure has been applied often different strategies are combined so as to create synergy effects (see Table 4).

Table 4 : Bundling of commercial transport measures in CIVITAS cities

Civitas City	Number of measures applied in the city					Number of strategies applied within one measure
	1	2	3	4	≥5	
Barcelona	■					3
Berlin				■		2 and more
Bremen	■					2
Bristol	■					1
Burgos	■					3
Genoa	■					3
Göteborg					■	2 and more
Graz	■					2
Krakow	■					1
La Rochelle			■			2
Malmö					■	1
Norwich					■	3
Ploiesti	■					2
Praha	■					1
Preston	■					1
Rotterdam					■	1
Stockholm					■	2
Toulouse	■					3
Venice	■					2
Winchester	■					1
<i>Total</i>	13	0	1	1	5	

¹³ The measure characteristics summaries for each relevant city the measures applied within the parking strategy

The combination of strategies and measures depend on the focus of the city, the preparedness to tackle complex urban transport problems, the courageousness to venture into uncharted urban transport planning terrain and willingness to solve problems with many and very different actors.

Out of 20 cities seven cities applied more than 3 commercial transport measures and at least 50% of the cities deploying an individual commercial transport measure combined two and more strategies within the measure.

4 Experiences made by European cities

In this chapter 47 examples of *'how to go about urban commercial transport?'* are presented. Most of the information is taken from the fact sheets available on the CIVITAS website www.civitas-initiative.org. Some of the descriptions are complemented by information from evaluation reports. The description follows the alphabetical order of the cities. Measures realised during the CIVITAS I phase are described as completed. Measures implemented during CIVITAS II phase are still ongoing and final results have not yet been achieved.

All information, pictures, graphs and tables used are taken from the fact sheets which are available on CIVITAS website

http://www.civitas-initiative.org/measure_fields.phtml?lan=en .

Additional information are taken from the project reports which are available on the CIVITAS download centre

<http://www.civitas-initiative.org/downloadcenter.phtml?lan=en> .

Tables 5, 6 and 7 serve as an introduction and guide; they provide an overview on the broad spectrum of commercial transport measures applied in the CIVITAS cities and make it easier to look up measures of interest.

Table 5 : Overview on applied commercial transport measures in CIVITAS cities

CIVITAS City	CIVITAS Measure	Measure fields											Project	Sub-chapter	
		Distribution scheme	Urban Distribution Centre	Loading and Unloading	Loading Zone	Clean vehicles/clean fleet	Fleet management and route planning	PP co-operation	Access management/	car sharing	travel information	Parking Management			
Barcelona	New concepts for the Distribution of Goods in Barcelona	X		X	X	X								Miracles	4.1
Berlin	Inner-City Logistics Centre, Container Track System		X	X										Tellus	4.2
Berlin	Inner-City Logistics Centre, Trimodal Logistic Services		X			X								Tellus	4.3
Berlin	Introduction of CNG-powered Vehicles					X								Tellus	4.4
Berlin	New forms of financing-contracts for Natural Gas Vehicles					X		X						Tellus	4.5
Bremen	City-Logistics in Bremen	X	X											Vivaldi	4.6
Bristol	Freight Consolidation Scheme	X												Vivaldi	4.7
Burgos	New goods distribution scheme in Burgos	X	X	X										Caravel	4.8
Genova	Enlarged goods distribution scheme in Genoa		X			X	X							Caravel	4.9
Göteborg	Environmental Zone for Heavy Duty Vehicles								X					Tellus	4.10
Göteborg	Incentives for improving the load rate in inner-city freight distribution	X			X									Tellus	4.11
Göteborg	Introduction of clean waste collection vehicles					X								Tellus	4.12
Göteborg	Consumer driven goods management from a Mobility Centre base		X											Tellus	4.13
Göteborg	Incentives for purchasing of CNG/CBG heavy duty and distribution vehicles					X								Tellus	4.14
Graz	Green city logistics	X					X							Trend-setter	4.15
Krakow	New goods distribution scheme in Krakow	X												Caravel	4.16
La Rochelle	City Logistics Strategic Extension	X				X								Success	4.17
La Rochelle	Customers services associated to goods distribution	X				X								Success	4.18
La Rochelle	Development of partnership with logistic operators	X						X						Success	4.19

Table 6 : Overview on applied commercial transport measures in CIVITAS cities

CIVITAS City	CIVITAS Measure	Measure fields										Project	Sub-chapter
		Distribution scheme	Urban Distribution Centre	Loading and Unloading	Loading Zone	Clean vehicles/clean fleet	Fleet management and route planning	PP co-operation	Access management/	car sharing	travel information		
Malmö	Car sharing for business and private persons									X		Smile	4.20
Malmö	Clean heavy vehicles with CO2 cooler					X						Smile	4.21
Malmö	Extended environmental zone for heavy vehicle and enforcement							X				Smile	4.22
Malmö	Heavy Eco Driving						X					Smile	4.23
Malmö	Freight driver support						X					Smile	4.24
Malmö	Satellite based traffic management for SME's						X					Smile	4.25
Malmö	Sustainable SME logistic for the food industry	X										Smile	4.26
Norwich	Customised traffic and travel information service for freight operators									X		Smile	4.27
Norwich	Development of Strategic Freight Holders Club to					X	X	X				Smile	4.28
Norwich	Goods delivery to Park & Ride Sites	X					X					Smile	4.29
Norwich	Priority access for clean goods vehicles					X						Smile	4.30
Norwich	Urban transshipment centre		X			X		X				Smile	4.31
Ploiesti	Freight partnership, planning, routeing, signing						X	X				Success	4.32
Praha	Widening the Environmental Zone for Vehicles over 6 tons								X			Trend-setter	4.33
Preston	Freight Partnership	X										Success	4.34
Rotterdam	Electric Vehicles for the distribution of goods					X						Tellus	4.35
Rotterdam	MultiCore Tube Logistics	X										Tellus	4.36
Rotterdam	Quality network for sustainable freight transport							X				Tellus	4.37
Rotterdam	Truck Parking Management										X	Tellus	4.38
Rotterdam	Cleaner vehicles for waste collection					X							4.39

Table 7 : Overview on applied commercial transport measures in CIVITAS cities

CIVITAS City	CIVITAS Measure	Measure fields										Project	Sub-chapter	
		Distribution scheme	Urban Distribution Centre	Loading and Unloading	Loading Zone	Clean vehicles/clean fleet	Fleet management and route planning	PP co-operation	Access management/	car sharing	travel information			Parking Management
Stockholm	Clean and efficient heavy vehicles					X							Trend-setter	4.40
Stockholm	Waste collection with biogas-vehicles					X							Trend-setter	4.41
Stockholm	Logistic centre for Old Town of Stockholm		X			X							Trend-setter	4.42
Stockholm	Material logistic centre - construction site				X								Trend-setter	4.43
Stockholm	Widening of the Environmental Zone							X					Trend-setter	4.44
Toulouse	Clean urban logistics and goods distribution platform in Toulouse	X	X					X					Mobilis	4.45
Venice	Clean Urban logistics in Venice			X		X							Mobilis	4.46
Winchester	Fleet efficiency and home delivery in Winchester	X											Miracles	4.47

4.1 *New concepts for the Distribution of Goods (Barcelona)*

Miracles

CIVITAS Project

Measure field

Distribution scheme, Loading and Unloading, Loading Zone

Keywords

multi-use lane, night -time deliveries, Loading/Unloading web guide, kerbside regulations

Status

Implemented

Measure description

Within MIRACLES and under the goals of the local Mobility Pact, Barcelona Municipality has sought to achieve an agile and orderly distribution of goods throughout the city.

Various measures have been demonstrated, namely:

- the extension of the multi-use lane implementation,
- night -time deliveries
- Loading/Unloading (L/U) active guide: web info and targeted enforcement
- special (PICT) kerbside regulations.

The multi-use lane implementation in Barcelona extends the total length of lanes and converts on-street parking spaces into unloading spaces during the prescribed hours. During the peak hours, the lane is used as a priority bus lane. The web-based information service "Active Guide" gives bus priority regulations as a variable message sign.

Objectives, innovative aspects

The objectives were focused on:

1. Improving Municipal management of vehicle circulation on the main and local road networks.
2. Reducing delivery times and costs.
3. Developing mechanisms to self-finance the successful scheme elements.

Implementation

1) Multi-use lane: Addressing Objective 1, a multi use lane was installed along Travessera de Gràcia Street, a primary road comprising 4 lanes, having a total length of 1500m. One lane was allocated to bus priority between peak hours (with on-street parking during peak hours, and to goods deliveries during allowed overnight). Variable Message Signs (VMS) were installed along the section to clearly communicate the regulations to road users, with illuminated studs providing horizontal delineation of multi-use lane.

The Multi-use scheme was implemented under a contract awarded to ETRA in spring / summer of 2002. A significant police enforcement effort was made at the commencement of operation. 44 on-street car parking spaces were replaced by the multi-use lane regulations, such that the capacity for unloading was significantly increased (approximately 30 spaces allowing 30 minutes per operation gives a capacity of over 400 slots between 10.00 and 17.00).

2) Night-time deliveries: Addressing all three objectives, goods operator Mercadona has trialled adapted 40T lorries and special equipment and operations for quiet deliveries at night. To do this, the Municipality has introduced experimental traffic regulations. Traffic police have

collaborated with the Municipality to measure noise levels in residences close to the supermarket sites.

The first night-time quiet delivery trial was made at the Mercadona supermarket in Valencia Street in 2003, with an adapted 40T truck. To do this, the Municipality had to introduce experimental traffic regulations. Traffic police collaborated with the Municipality to measure noise levels in residences close to the supermarket sites. The trials with 40T trucks were extended to 5 other locations around the city during 2004. In addition to the adaptations to the vehicles, staffs were trained to realise the unloading operations using a set of procedures aimed at minimising verbal communication and other noise.

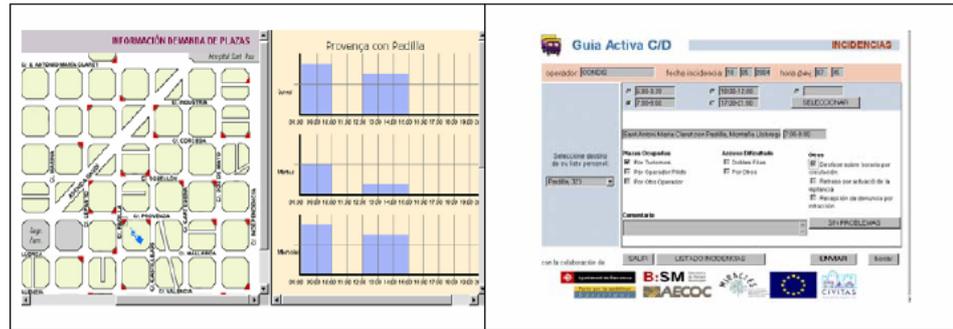
*Figure 1:
Quiet night-time unloading using adapted 40T truck
at Mercadona's Valencia St outlet.*



3) 'Loading /Unloading' (L/U) Active Guide: web info & targeted enforcement. Addressing Objectives 1 and 2, and covering a pilot area of some 0.5 sq. km. (with 230 reserved spaces serving a potential demand of 1085 premises), 8 supermarket operators + 3 distribution companies exchanged information via the web with the Municipality. The Municipality produces aggregated information to registered operators to enable them to plan to avoid hot spots (times and locations of congested delivery). The information analysed from the first 9 weeks was used by the municipal police to prioritise on-street enforcement action for a further 12 week period.

The web-based L/U Active Guide was trialled between March and June of 2004 for a pilot area covering 40 junctions. It involved 8 supermarket operators + 3 distribution companies exchanging information via the web with the Municipality during a 16 week period. The following figure shows an example of the output achieved using the input page.

Figure 2: Map of the Active Guide area showing the delivery zones and their occupancy level (by day of the week) on the night is the web page for incidence reporting



Traffic police from three different jurisdictions were involved in the enforcement of the second phase of the Active Guide trial. To facilitate monitoring, operators' vehicles carried an identification card.

Figure 3: Lorries participating in the Active Guide pilot showing identification card



4) PICT Trials (special kerbside regulations): It consists of temporary short-term loading /unloading spaces with special regulations restricting access to the kerbside directly in front of the supermarket to vehicles "authorised" by the 3 participating operators (Caprabo, Sorli, SuperSol). The supermarkets are located at more than 25m from the existing reserved spaces.

The traffic police also participated in the PICT trials of special kerbside regulations. Different road types were included in these trials; one primary road (4 lanes in total, peak-hour clearway giving 4 circulating lanes) and two secondary roads (one having a total of 4 lanes, two for circulating traffic, the second having 4 lanes, one being a dedicated cycle lane, one for circulating traffic).



Figure 4: PICT scheme experimental signing

1) The Traverssera de Gracia multi-use lane demonstrates peak bus priority, improved off-peak unloading and better traffic circulation. By suppressing daytime car parking (over 40 spaces) the possibility that the second (of four) lane(s) becomes blocked is very much reduced. As a result, the journey times of general traffic are reduced by 12 to 15% according to the time of day. Furthermore the bus operator has perceived improvements in bus running speeds.

Results

2) Operator Mercadona has demonstrated that quiet delivery is possible with a 40T lorry serving supermarkets with a rather large capacity and with substantial refrigeration facilities. Noise measurements, comparing ambient noise levels on nights when the delivery was / was not being made, show that the maximum values recorded in the street varied by only 0.1 dB(A), average with unloading of 52.2 dB(A). Mercadona estimates that investment in vehicle adaptation is recoverable within 3 years.

3) In setting up the L/U Active Guide trial, based on data aggregated from a dozen operators it was found that only 36% of the deliveries could be made using reserved spaces within 25m distance of the store. For the (smaller) pilot area, with 230 spaces available, street observations quantified the demand/supply ratio to be 112% (after taking into account levels of illegal parking by cars). The detailed reporting of delivery problems via the web, found that operators encountered difficulties on 553 of the 1772 occasions when deliveries were made during the 17 weeks of the trial. Enforcement, targeted at 3 "hot spots" where particularly high levels of problems had been reported, achieved an average reduction in problem-reporting of 19%.

4) Special kerbside regulations were trialled at 3 locations: (primary road, secondary road + free parking lane, and secondary road + free parking lane + bike lane). One supermarket showed that, by eliminating a 30m delivery distance (and using roll containers instead of pallets) total delivery time was reduced from 27 to 8 minutes. Operators' reports show deliveries to be concentrated in the early morning (some 36% of all deliveries are made between 07.00 and 09.00), and more than a third of incidence (problem) reporting occurs in this time period; MIRACLES has quantified a problem that current regulations do not address.

Although the Municipality provides enough spaces to satisfy city-wide demand, operators experience considerable problems at microscopic level. The exchange of information via the Active Guide web shows how targeted enforcement can resolve some short-term problems. It also highlights the pressure on supermarket deliveries during early morning. Operators, and enforcement agencies have collaborated with the Municipality to demonstrate a range of practical solutions; quiet night-time and off-peak delivery (multi-use lanes and PICT kerbside regulations) have been demonstrated to be effective solutions for several different road / delivery situations.

Lessons learned

Another lesson learned is that the road authority needs to do more than better match spaces supply with demand at the disaggregated level; operators will invest in solutions that are customised to their requirements.

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Last update

4.2 Inner-City Logistics Centre, Container Track System (Berlin)

Tellus

CIVITAS Project

Measure field

Urban distribution centre, Loading and uploading

Objectives, innovative aspects

Demonstration of a new telematics based container track system. The system is particularly intended to supervise rail freight transports in the multimodal container traffic. The task is to provide safety standards, especially punctual delivery and the possibility to locate the containers at any time during the transport.

The Measure

A new container track system has been designed and applied by one of the biggest forwarding companies (company Zapf) for the inter-modal freight transport from the inner-city logistic centre. It has been demonstrated that the new container track system enhances the economic efficiency of the inter-modal freight transport (long distance by rail – provided that a regular railway service will be offered -, distribution on road) while obtaining positive impacts for the environment (emissions, noise, energy consumption). The demonstration is focused on the field of "relocation transport" with a security supervision in order to enhance the quality of transport service. That improved quality is seen as pre-condition for the expansion of the inter-modal container transport using rail (or inland navigation) on the long-distance run.

Implementation Status

Container track systems of 3 suppliers have been verified and pre-tested (comparison concerning the technical parameters, reliability). One supplier was selected. In February 2003 the five prototypes of the selected system have been demonstrated. A few outstanding technical problems have been solved. After revision the new container track system has been tested successfully from the technical point of view. At the TELLUS-meeting in Berlin (February 2003), the container track system has been explained at the Inner city logistics centre at BEHALA-Westhafen. The features of the system are: location detection by GPS, autonomous power supply by cell system and a buffer battery, loading space control/level indicator by ultrasound, temperature, pressure and humidity control.

(Expected) Results

As next step the SW-adaptation and demonstration under real conditions with up to 500 container track systems is foreseen. Unfortunately in June 2003 the German Railways (DB) have decided to provide regular container train operation to the logistic nodes Großbeeren in the south and Wustermark in the west of Berlin only. The operator of the Inner City Logistic Centre was trying to organize shuttle container trains to the outside logistic nodes.

Thus, the handling of long-distance tenancy changeovers became uneconomic for Zapf, and consequently the company handed its entire long-distance business over to the Danzas haulage company. As a result, since the summer of 2003 about 5,000 containers have been transported by road instead of rail, corresponding to around 3,000 road trips. What is more, the container tracking system was no longer needed for the road-based transport, since on requirement Danzas offers to retrace transport processes for Zapf. Claims for and losses of goods are also more easily attributable to particular lorry drivers.

Last update

06-03-2006

4.3 Inner-City Logistics Centre, Trimodal Logistic Services (Berlin)

Tellus

CIVITAS Project

Urban distribution centre, Clean vehicles / clean fleet

Measure field

The measure aims to support the introduction of innovative logistic services (especially to reduce lorry-kilometres in the city) in the context of the further development of a tri-modal inner city logistics centre (inland navigation, railway traffic and road haulage) managed by BEHALA, the Berlin harbour and storage society, as well as to promote the introduction of CNG-powered distribution lorries by the partners (haulage companies) of BEHALA.

Objectives / Innovative Aspects

The establishment of an inner city logistics centre helps, because of its central location, to shift the modal split in favour of environmentally friendly inland navigation and railway traffic. Only short distances will remain for the freight distribution by lorries. A support of CNG-powered lorries for this distribution can further minimize the environmental damage by these transports.

The Measure

In November 2002 the first container ship transport started from and to Hamburg and Stettin. BEHALA was and is in permanent dialogue with several sea shipping companies to promote the innovative logistic services.

Implementation Status

Unfortunately in June 2003 the German Railways (DB) have decided to provide regular container train operation only to the logistic nodes Großbeeren in the south and Wustermark in the west of Berlin. These logistic nodes are located outside Berlin in the Land of Brandenburg. Other regular train services to and from Westhafen are not available. Therefore operations are reduced to some ship and lorry operations. By that BEHALA was not in a favourable position to strengthen the commitment of haulage companies in the area of Westhafen.

Although BEHALA was forced to reduce its efforts to complete the foreseen tri-modal logistics centre the reduction of environmental damage by supporting the introduction of environmentally friendly road distribution vehicles powered by CNG was pursued. Technical information for haulage companies was prepared in order to introduce CNG-powered distribution vehicles especially for the inner city distribution of goods coming from the port. Unfortunately there was still no offer of heavy CNG-lorries for the transport of containers. The dialogue with car-manufacturers on this subject has been started. The announced CNG truck of 11 tons overall weight was not allocated for the German market.

(Expected) Results

04-01-2006

Last update

4.4 Introduction of CNG-powered Vehicles (Berlin)

CIVITAS Project

Tellus

Measure field

Clean fuels and vehicles

Short measure description

The measure aims at introducing CNG-powered lorries in different weight classes for inner-city freight distribution.

Objectives / Innovative Aspects

Introduction of 100 CNG-powered road distribution vehicles in different weight classes (from 1.3 t to > 12 t) for inner-city freight distribution, achieving Euro IV/EEV standard for vehicles, in Berlin. This CNG vehicles project in Berlin offers the necessary financial incentives and target group orientated information measures in order to introduce the critical mass of vehicles in short-term.

The Measure

CNG-powered vehicles provide considerable reductions in noise and pollutant emissions, especially compared to diesel propulsion prevailing the distribution vehicles.

Implementation Status

The strategy to introduce the CNG vehicles was discussed intensively amongst the Berlin Senate, the Chamber of Commerce and Industry, as well as the Subcontractor BEHALA (City Port Authority). These partners are willing to support the CNG-lorry-programme.

The guidelines for the financial promotion of the vehicles were prepared with the mentioned partners and the "Umweltbundesamt" (Federal Dept of the Environment).

The procurement of heavy CNG-lorries is very difficult because of missing market offers. Therefore GASAG negotiated intensively with the manufacturers especially with regard to an expanded offer of heavy CNG-lorries. To prepare the advertising measures on a realistic basis a short market-analysis was carried out. Technical details were compiled and informative and advertising materials have been produced.

(Expected) Results

There is always a significant lack of information. People are sometimes even afraid of dangers concerning gas engines. In addition to that there is a general disbelief towards the equivalent performance of CNG vehicles compared to conventional cars. Furthermore the German tax-privilege on natural gas as fuel has not sufficiently been noticed.

Therefore the information campaign was continued. It was planned to reach at least 100 CNG-powered vehicles for the inner city freight distribution and 9 Busses for the public transport in 2005. The measure was successful and more than 130 delivery vehicles have been introduced.

Barriers and drivers

Three **drivers** promoted the measure. The European air quality directive supported an increasing demand for CNG-lorries. The steady rise of the price of crude oil results in an increased demand for CNG-vehicles. Embedding the TELLUS-measure in other CNG-related demonstration measures in Berlin was very helpful. In this context the TUT-project (Tausend Umwelttaxis, 1000 environmental taxis) of the Federal Ministry of Environment to promote taxis with CNG-engines and the promotion of private CNG-driven cars initiated by GASAG were of particular relevance.

The measure was accompanied by two significant **barriers**. On one side there are only a few lorry-types with CNG-engines on the market. Since the end of 2002 CNG distribution vehicles with EURO 4 or EEV-emission standards became more available. But the main problem during the entire TELLUS-demonstration measure was the deficient supply of heavy CNG lorries, particular in the middle weight class. Additionally the ones that could be purchased were extremely expensive.

On the other side in the beginning of the measure there was a significant lack of knowledge about CNG vehicles. In addition, there was a general reservation towards the equivalent performance of NGV compared to conventional vehicles. Furthermore the tax-privilege on natural gas as fuel had not really been noticed.

23-03-2006

Last update

4.5 *New forms of financing-contracts for Natural Gas Vehicles (Berlin)*

CIVITAS Project

Tellus

Measure field

Public private co-operation
Clean vehicles

Objectives / Innovative Aspects

The offering of innovative financing models shall allow fleet operators (transport companies and other enterprises) to convert their fleet to natural gas (NG) propulsion in a cost effective way. It is planned to initiate and disseminate initiate leasing models, which refinance the higher investment costs for NG vehicles by lower operating costs and relevant promotion programmes. The market introduction of NG vehicles should be stimulated in a relevant area in Berlin and beyond.

The Measure

Several providers offer the financing of NG vehicles by leasing already. These offers are not attractive yet due to the risks referring to the residual value as well as to service and maintenance. On the other hand municipalities and companies such as stores, food and beverage retailers and parcel services have been identified as interesting target groups for optimised leasing concepts.

Implementation Status

A qualitative analysis of current financing models arrived to the conclusions that

- Leasing is the favoured financing strategy in some public and business sectors and, thus, a promising instrument for the market stipulation of NG vehicles.
- Leasing for NG vehicles can be designed economically profitable for leasing providers and users.
- Leasing providers identified numerous possibilities of own and cooperating PR activities.
- The public sector needs consulting referring to the possibilities of green procurement of NG vehicles and transport services under consideration of the procurement law.
- Leasing of NG Vehicles can be optimised through revaluation of the residual value, flexibility through km contracts and special offers integrated in market stipulation campaigns.

(Expected) Results

On this basis a draft of the proceeding for the market stipulation by new leasing models for NG vehicles was developed and presented to a professional audience at 21st November 2002.

In the beginning of the project it turned out that the initial project design was too ambitious. The project design had to be adapted to the situation that the standard available offers was not attractive enough for offering immediately a ton-km-leasing model. Therefore at first vertices of an attractive leasing contract for CNG vehicles were developed and promoted. Additionally a website was designed and launched, which provides information on the advantages of CNG vehicle leasing and supports potential customers in finding partners (www.erdgasfahrzeuge-leasing.de). Since a number of companies favour leasing their company cars, the provision and distribution of information as prepared in this demonstration measure was intended to help convincing companies to lease CNG vehicles.

Barriers and drivers

One of the main barriers turned out to be problems with internal communication and the allocation of responsibility. In this specific case, the persons responsible for customer contacts did not have the competence to make company-related decisions. This affected the measure in so far as the company's decision makers did not realise that a demand for CNG vehicle leasing already exists, and even though satisfying this demand might not translate into direct financial profits, positive impacts can be expected regarding the image of the leasing company.

Another barrier was the actual offer for CNG-leasing: In the beginning of the project it turned out that the standard available capacity was not attractive enough for offering immediately a ton-km-leasing model. So the project design had to be readjusted to the circumstances, it was too ambitious for these initial conditions. The result was the described vertices of an attractive leasing concept and the development of a website providing information for leasing-providers and customers about CNG-vehicle leasing.

Last update

27-07-2007

4.6 City-Logistics (Bremen)

CIVITAS Project

Vivaldi

Measure field

Urban distribution centre, Distribution scheme

Keywords

CNG trucks up to 12t gross weight, modernised IT equipment, development of a delivery service

Status

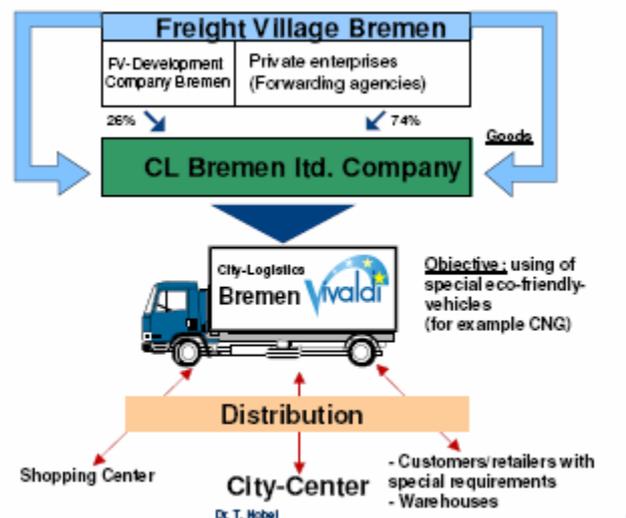
Parts implemented

Measure description

This measure is about the improvement and development of an efficient urban freight distribution through consolidation systems and logistic software. There is already some experience with city logistics in Bremen, as the first application took place in the mid- 90s. Based in the freight village ("Güterverkehrszentrum" GVZ) - the intermodal freight centre- the City-Logistik Bremen GmbH was founded to consolidate and deliver goods to recipients in so-called difficult inner-city areas. An update of City Logistik (CL) should happen with:

- Application of CNG trucks (up to 12t gross weight)
- Establishment of consolidated traffic into the city centre of Bremen and the region
- Development and application of telematics solutions for the optimisation of delivery flows

Figure 5: Bremen Freight Village Schematic



Objectives, innovative aspects

The key objectives of the project are to reduce the emissions and to improve the overall efficiency of goods delivery in Bremen.

Implementation:

The logistics packages are made of measures that try to enhance the efficiency and thereby the eco friendliness of the local freight transport. It includes the:

- implementation of low emission freighters
- introduction of modernised IT equipment
- development of a delivery service

One main element of this measure included the purchase of at least 4 CNG trucks. This could not be realised, because the vehicle industry could not deliver vehicles that had been ordered; or offered vehicles were not affordable. Because of this the potential impact of this measure had to be simulated.

Unfortunately another element of this measure, namely the development of a route optimising software, was not implemented so far that it could be tested in practice; this could therefore not be evaluated.

Since summer 2002, units for customers (forwarders) are consolidated every day in the Freight Village (GVZ) Bremen and transported to target areas (i.e. Shopping Centre, central warehouse).

Results

A truck mileage reduction of about 9,000 kilometres monthly is achieved by City Logistics. This correlates to 70 day-tours of trucks of the size range 7.5 t. All in all about 1,100 litres of diesel fuel are saved every month by the groupage-actions. Thus a verifiable reduction of emissions can be achieved.

(1) Consolidation of delivery trips to a regional shopping centre

Consolidation of delivery trips means that one carrier takes over a number of jobs that formerly had been done separately. Through consolidation, the number of trucks can be reduced. CL for example took over the cargo of two carriers from GVZ (Bremen) to the regional shopping centre Dodenhof (Posthausen). The shopping centre is 50km from the freight village GVZ. A round-trip (including local distribution routes) is about 120km. CL does this trip 20 times per month with a truck-trailer combination. By using a self unloading unit CL can move the goods into the warehouse easily and thereby reduce the times of loading and charging significantly.

The table below covers the monthly operating costs for goods transport. It shows the economic advantage of the consolidation. Before consolidation, two carriers had to each use a HGV, which are now replaced by a truck-trailer combination. The costs for two carriers amounted to 3.52 (=2*1.76) Euro/km. They are now reduced to 2.02 Euro/km. This amounts to a cost reduction of 42.7%.

	Solo-HGV	truck-trailer combination
leasing HGV	1280,10	1.280,10
leasing trailer	-	560
Fuel and lubricants	322,37	381,94
truck driver wage	2.045,20	2.045,20
social insurance	315,94	315,94
expenses driver	96	96
employers' liability insurance association	58,56	58,56
transport insurance	34,26	34,26
cellular phone	50	50
wash/small costs	15	15
total costs per veh.	4.217,43	4.837,00
cost per km	1,76	2,02

Consolidation of transport saves fuel: the operating data of CL shows that a single truck consumes 18.5 l Diesel per 100km, whereas the fuel consumption of the truck-trailer combination is 21.8 l Diesel per 100km slightly higher. This leads to a 41.8 % reduction of fuel consumption for the trips to the shopping centre.

(2) Scenarios for cleaner goods transport by consolidation and CNG trucks

The following table shows how freight consolidation and the use of clean vehicles reduce the emissions caused by the distribution of goods within the city. All scenarios simulate goods transports from the freight village to three different locations in the city.

In scenario 1 this is done by 3 carriers using each a conventional truck. In total 100 vehicle km are necessary for this transport. Scenario 1 is the reference quantity to which the other scenarios are related. In scenario 2 the carriage is loaded on one truck (consolidation), which reduces the vehicle km from 100 to 60km and also reduces the emissions. If the truck has a diesel soot filter, as in scenario 3, micro particle emissions can be reduced to 12% (compared to 100% in scenario 1). The best situation is in scenario 4. A CNG truck emits hardly any particles (emission reduced to 1% of scenario 1) and the emissions of NOx are also very low (18% of scenario 1).

Table 2.9.3-30 Scenarios for the impact of consolidation and CNG usage in freight transport

Scenarios	vehicle-km	particles [g]	NOx [g]
Scenario 1 - Situation at present, several trucks	100	16,100 g	703,0 g
		(100 %)	(100 %)
Scenario 2 – bundling with conventional truck	60	9,660 g	421,8 g
		(60 %)	(60 %)
Scenario 3 – bundling with truck diesel soot filter	60	1,932 g	421,8 g
		(12 %)	(60 %)
Scenario 4 – bundling with truck running on CNG	60	0,145 g	126,5 g
		(1 %)	(18 %)

Barriers and drivers

City Logistics have to deal with several structural problems and developments. The following list gives an overview of different barriers for the growth of city logistics:

- CL usually provides only transport services (value-added- services are often missing)
- Fluctuation/variation of delivery items / low level of "classic" CL-goods (approx. 20% market share)
- Co-operation structure (almost no retailers but only wholesalers) – high intensity of competition
- Telematic problems: Exchange of data, collection activity, interfaces
- Corporate identity problematic
- There is no regulatory political preference for the CL vehicles
- Reduction of delivery sizes (more and smaller shipments – the grouping of goods is difficult)
- Intense growth of the courier, express and parcel services ("ebay-isation")
- Economic problems after ending of the financial model support - for example: the high costs for the grouping of the goods endanger the economic success

All together these factors explain why the success of this measure, particularly in the city centre, is limited.

Lessons learned

A city logistic company focussed solely on delivery to the city centre is not viable: successful companies get most of their profit by serving clients with special needs and by delivering to other "problem areas". In order to sustain the service, city logistic companies need regulatory policy support; some kind of prioritisation in terms of delivery times or exclusive access is required.

Regarding the use of CNG trucks the situation is even worse. The vehicle manufacturers appear not to be taking the risk to push CNG in road freight transport. As stated in the implementation report: "Promising advertising of CNG trucks from car manufacturers always ended up with disappointing offers. Announcements of the new DING technology (direct-injection natural gas engines) are only running as field tests with one truck and will not be on the market before 2005. Volvo will produce a new diesel truck which will fulfil EURO V standards in late 2004 and totally abandon the CNG programme. Mercedes will not produce 7.5 to 12.0 ton CNG trucks, because the research department is focusing on fuel cell and hydrogen technology." The plan to buy at least one vehicle at the end of the VIVALDI project failed in June 2005, because a promised and advertised truck (IVECO EURO CARGO 12.0 ton CNG) has not been delivered due to a sudden management decision.

Although city logistic is well known in the City of Bremen there is still the need to approach new clients with a new concept. This is calculated with 15.000 Euros.

Financing aspects

The most cost intensive part is the development of a new logistic concept to combine city centre delivery with bundling transport in the peri-urban area. The efficiency of the operational fleet with high loading rates is only possible with new software which can communicate between the vehicle and the distribution centre. The software is tested as a b-version in one of the trucks already. After a successful test, which will eliminate remaining failures, the full software version will be implemented. Both activities are calculated with 177'000 Euros which will be spent in the VIVALDI project.

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Last update:

4.7 Freight Consolidation Scheme (Bristol)

CIVITAS Project

Vivaldi

Measure field

Distribution scheme

Status

Implemented (and maintained)

Measure description

At the commencement of VIVALDI there was little co-operation between organisations involved in goods distribution at the local level within the Clear Zone. Organisations made individual delivery arrangements, which contributed to duplication in effort and increased numbers of goods vehicles. This measure has developed a co-operative city logistics scheme to increase the efficiency of the goods distribution network and reduce traffic impacts. A pilot scheme has been created utilising freight consolidation to reduce the numbers of delivery vehicles entering the Broadmead city centre shopping area of Bristol. This retail area comprises 325 retail units and receives over 100,000 deliveries per year. The pilot uses vehicles meeting Euro III standard whilst clean fuel options continue to be explored.

Objectives, innovative aspects

The aim of the freight consolidation scheme is to minimise the impact of freight deliveries and to:

- Lessen the number of delivery vehicles operating in the target area;
- Contribute to traffic reduction in the target area;
- Reduce the conflict between vehicles in loading areas and delivery bays;
- Help to improve air quality in the city centre area;
- Contribute to a reduction in supply chain costs;
- Provide an enhanced delivery service for retailers and allow them to take advantage of other services

Implementation

An initial step in the development of the consolidation centre was to understand the current freight distribution patterns in Broadmead. In autumn 2003 a survey of retailers in Broadmead was undertaken, with a total of 118 surveys completed using face-to-face interview techniques. The survey data was analysed to provide a list of retailers that fit the consolidation criteria, and who will be invited to participate in the trial. The recruitment of retailers began in April 2004 with Exel taking a lead role in this aspect of the scheme. The consolidation centre commenced operation on the 17th of May 2004 with the aim to build up to full capacity over a period of time.

A total of 53 retailers have taken part in the Freight Consolidation Scheme in Bristol since its introduction in May 2004, with the number of retailers increasing throughout the duration of the scheme.

The consolidation centre is to be maintained after VIVALDI, in association with an expansion to the Broadmead shopping area. Value added services are being added to the scheme, including the collection of recyclable materials, and the scheme is progressing towards financial self-sufficiency.

The centre started operation in May 2004, and the benefits started to accrue as more and more retailers joined the scheme. One VIVALDI-branded 7.5t lorry was used when the service was launched, which was subsequently assisted by a 17t vehicle.



Figure 3.24a Freight Consolidation Vehicle



Figure 3.24b Consolidated Delivery

Vehicle utilisation started at 35% in May 2004, increasing gradually to 61% by December and averaging 65% through 2005. The average number of roll cages delivered each month had surpassed 1,000 by the end of 2005, a tenfold increase from scheme launch. There has been a reduction in delivery vehicle movements to participating retailers every month since the introduction of the scheme. Generally, the percentage reduction in vehicle movements has been over 50%, regularly surpassing 70%. A reduction in vehicle kilometres travelled is evident every month since the start of the scheme and this reduction has remained at over 1,000km per month since June 2004, occasionally up to 5,000km. Mirroring the reduction in distances travelled, harmful emissions have been greatly reduced: The graphs for savings of NOX and PM10 mirrors the pattern Figure 3.25, resulting in savings of up to 100g and 1,300g every month, respectively.

All of those retailers that responded to the monthly satisfaction survey thought that deliveries were made on time and no discrepancies or damages to deliveries had been experienced. All retailers felt that the delivery team had left the delivery area clean and tidy and, for those retailers that had items collected by the centre, all felt that they had been taken at the correct time.

Interview surveys were undertaken with a small number of store managers of members and non-members of the consolidation scheme. It was found that delivery times are generally shorter for those retailers that are involved in the consolidation scheme. The majority of those involved in the scheme also agreed that the way in which deliveries are made now saves staff time and that the time and method of deliveries was now more reliable and created fewer access problems in delivery areas.

The City Council, and 3 neighbouring local authorities, have been working with the freight sector to form a Freight Quality Partnership (FQP). This forum has provided a mechanism to discuss innovative freight concepts, and the Commercial Vehicle Drivers' Atlas is the first output from this partnership. The Atlas was launched in March 2003 and enables freight vehicles to find the most appropriate routes (including the presence of height and weight restrictions) for deliveries to business parks and other key destinations in the city.

With regard to the freight consolidation scheme the City Council has selected, through tendering, logistics experts Exel to operate and manage the scheme.

Lessons learned

The scheme has had a very high beneficial affect in reducing goods vehicles distances in Bristol city centre and a consequent reduction in air pollution. All members of the scheme have reported favourably on the service received, and the numbers have continued to grow. The consolidation centre is to be maintained after VIVALDI, in association with an expansion to the Broadmead shopping area. Value added services are being added to the scheme, including the collection of recyclable materials, and the scheme is progressing towards self-sufficiency, with contributions being sought from participating retailers.

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Last update:

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4.8 New goods distribution scheme (Burgos)

Caravel, CIVITAS II

CIVITAS Project

Distribution scheme, Urban distribution centre, Loading and unloading

Measure field

Ongoing

Status

The goods distribution as an essential service for the cities vitality requires new regulations to get adapted to the progressive pedestrianization in the city centre. Vehicle transit has to be reduced in the "clean zone" although goods delivery must continue. Cleaner vehicles will be introduced for goods distribution in the "clean zone".

Measure description

Goods distribution and delivery patterns to urban centres are very similar. In Burgos, numerous central warehouses outside the city distribute merchandise on a daily basis in small vans that circulate around the city dropping off their orders. Some of the problems related to this type of distribution are:

- Numerous vehicles of various sizes depending on the goods they carry.
- Circulation throughout the entire city and entry into unique, sensitive zones in the historic centre that aggravates traffic problems.
- Double parking during loading and unloading due to unauthorised occupancy of parking bays reserved for loading and unloading.
- Delivery vehicle access to pedestrianized zones of the city, disrupting the 'pedestrianized' atmosphere.

The general objectives of this measure are as follows:

Objectives, innovative aspects

- Reduced vehicle transit in the "clean zone".
- Introduction of cleaner vehicles for goods delivery in the "clean zone".
- Regulation of the distribution areas.
- Optimisation of delivery and distribution schedules.
- Use of cleaner delivery vehicles in restricted-access zones.
- New concepts for the management of deliveries.
- Use of information technology to support the process.

Innovative aspects

This measure is in progress in the city. The goal of the measure is to improve the goods distribution in the "clean zone" of Burgos by:

Implementation

- Analysis of the situation and involvement of distributors, logistics services, industries.
- Analysis of social and economic feasibility and satisfactory layout of the new goods distribution system.
- Analysis of the conditions and involvement of distribution companies, logistics services and industries.
- Designation of the affected zones and identification of the stakeholders involved.
- Specification of management criteria for goods distribution in the city.
- Design of a new concept for distribution in the "clean zone".
- Design of routes, schedules, products and areas for the distribution of goods.

- Designation of specific parking zones around the “clean zone” for loading and unloading.
- Introduction of cleaner vehicles for goods delivery in the “clean zone”.

(Expected) Results

- Three delivery vehicles running on cleaner fuels in service at the goods distribution in the city centre by the end of the project.
- 20 % reduction in air pollution in the urban centre linked to fewer delivery vehicles entering the restricted-access area.

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Last update:

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4.9 Enlarged goods distribution scheme (Genova)

Caravel, CIVITAS II

CIVITAS Project

Urban distribution centre, Clean vehicles / clean fleet, Fleet management & route planning

Measure field

Ongoing

Status

The aim of the measure is to create an alternative concept of goods distribution, less invasive for citizens' life and with a low environmental impact.

Measure description

The objectives are: to reduce traffic congestion and pollution generated by traffic flows for goods urban deliveries; to optimise the collection and delivery process through the direct involvement of the directly interested stakeholders.

Objectives, innovative aspects

The innovative aspects are directly connected with the new concept: to set up an integrated system to regulate freight distribution, using different techniques to support the regulations for access of commercial vehicles, also using software and hardware developed for the project and tested during the experimental phase.

The measure is implemented through a "tool box": a series of instruments to be used in a coordinate way and to be customized on the characteristics and the needs of the single target area. The initiatives listed in the following are part of this "tool box":

Implementation

- To set up a "Mobility Credits System" which consists in binding the freight vehicles' access in the target area to the payment of a predetermined mobility credits amount, preliminarily distributed by the public administration to all the economic activities in this area.
- To set up one or more small "proximity warehouses" (little-sized premises where small goods may be temporarily stored) to discourage the traders to use their own cars to transport goods to the shops.
- To rationalize the vehicles' use, by the traders who transport goods to the shops with their own cars, through the introduction of a Van-Sharing service (car-sharing service dedicated to goods transport).
- To elaborate a unitary and coherent regulation for the access of commercial vehicles in the target areas.

In particular, the mobility credits scheme will be developed between measures 07.01 and 10.01 as it involves some common aspects between the two measures.

The collection and elaboration of the data about the detailed classifications of commercial activities by typology inside of the historical centre have been carried out.

A "participated design" approach with the main stakeholders (shopkeepers, artisans and transporters' associations), has been adopted to develop the logical scheme and to perform the most important phases of the design process (acquisition of information, tuning of the parameters, etc.). A specific agreement has been signed between the Municipality and the Associations of Shopkeepers and Artisans.

The regulation scheme is being designed, and the application of Mobility Credits methodology for the reduction of traffic congestion and environmental impact will be directly connected to the historical centre access system and it will be checked through the electronic gates.

In the next months, the gates to the historical centre will be equipped with electronic gates (TVCC (Close Circuit Tele Vision) and OCR (Optical Character Recognition) system, in order to identify the commercial vehicles crossing the gates.

(Expected) Results

- Estimated reduction of 15 - 20% of the traffic of commercial vehicles in the target area,
- Improvement of the road congestion levels
- Reduction of the emissions;
- Involvement of traders that now use their own cars to transport goods;
- Possible economic returns deriving from the regulation of access to the zones controlled.

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Last update

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4.10 Environmental Zone for Heavy Duty Vehicles (Göteborg)

Tellus

CIVITAS Project

Access management/ Enforcement

Measure field

Implemented

Status

The demonstration was intended to evaluate the existing Environmental Zone. The aim was also to develop a new proposal with new criteria for vehicles entering the Zone and to develop a proposal for an expansion of the Zone and to test an on-board measurement for NOx. This demonstration should also increase the communication between the Traffic and Public Transport Authority, the local transport industry and the Industry Ministry. In addition to this, clear and visible signposting of the existing zone was also one of the intentions of the demonstration.

Measure description

Evaluation, further design and enlargement of an existing Environmental Zone in Göteborg to stimulate the incorporation of Euro IV criteria, including introduction and on site measurement system for emission control of individual vehicles.

Objectives, innovative aspects

The development of the existing Environmental Zone in Göteborg comprises two elements. One element is to geographically expand the existing Zone. This involves Göteborg alone. The other element is to change the regulations for vehicles allowed to drive within the Environmental Zone. The latter has been undertaken together with the other Swedish cities with existing Environmental Zones (Stockholm, Malmö and Lund). Within the demonstration measure NOx-reducing long-route EGR (Exhaust Gas Retrofit equipment) system has been tested, as well as development and validation of an onboard measurement system for heavy vehicles.

Implementation

1) To be able to continue the work on expanding the Zone area, the definition has to cover places of work. The co-operating cities have jointly developed a new definition of a special environmentally sensitive area in 2004. The new definition means that it is possible not only to include areas where large numbers of people live, but also areas where people work or locations near traffic routes.

2) The development of new criteria for entering the environmental zone is done in co-operation between Stockholm, Malmö, Lund and Göteborg. Together the cities have made a proposal, which means that vehicles that are not euro-classed are allowed to enter the zone if they are not older than 6 years. The exceptions of this rule are based on vehicle emission.

3) One element of the demonstration was to carry out field tests on two different vehicles for approximately 2 months in Göteborg. The aim was to increase understanding of the degree of reduction from the NOx-reducing long-route EGR system, as well as the development and validation of an onboard measurement system. A delay concerning these NOx on-board measurements was due to reorganization of the company EN Sverige AB into The ETG (emission technology group). The report on the on-line emission testing was completed in June 2004. The equipment produced for mobile measurement of NOx emissions from "Heavy Duty" diesel vehicles consists of a NOx sensor (with built-in lambda sensor), a pressure sensor, a speed sensor, a PC logger and the

relevant accessories. These instruments were fitted to two buses operating in Göteborgs Spårvägar's (Göteborg Tram) regular traffic. The equipment seems to function well for its purpose, but could be fine-tuned and developed further.

Results

A political decision for the enlargement and for the new criteria will be taken during 2005. The new engine technology together with the regulations has been a success factor to decrease the emissions in Göteborg. On-board measurements: The field tests with the two buses produced different results. Based on various algorithms, logged measurement data and a number of graphs showing NOx emissions in various phases during the analysis period, it has been possible to calculate the final result. NOx emissions from one vehicle were reduced by approximately 36 % and from the other by around 18 %. The difference in the percentages measured is the result of many different factors. One of the important factors is that the control and mapping of the EGR system were designed following testing as per the Braunschweig bus cycle and thus are not 100 % optimized for various routes/services, vehicles/engines and the various driving styles of different drivers, which is hugely important for NOx reduction. ETG has subsequently developed an adjustment algorithm based on a so-called "closed loop," which can be assumed to compensate for these variations. Naturally, these factors may have contributed to the result that NOx purification on different vehicles varies. The measurement method may also have been a factor in this, and it could be refined and developed further.

Barriers and drivers

Legality and technical barriers

Increased co-operation between the (Swedish) cities and the Industry Ministry has been established. This has resulted in a final proposal for the regulations, which has been developed together with the Industry Ministry. The existing regulations have two problems that need to be solved, and this is also why it is so important for the cities to implement the proposed regulations as soon as possible. One problem is the legality of the existing regulations because of some questions from the EU commission in 2002, and the other is lack of technical scope. There has been a request from the EU commission concerning the legality of the exemptions from the regulations in the Environmental Zone. The regulations for the Environmental Zones in Swedish cities are not allowed to contain any details that could infringe on free trade between members of the EU. The EU commission is investigating the regulations of the Environmental Zone and if the regulations can be seen as a hindrance to the solidarity rules, the legality of the Zone may be questioned. This also made it very important to co-operate with the Industry Ministry. There are also technical difficulties in continuing with the existing regulations because of exemptions to the regulations. The exemptions allow vehicle owners to drive for an additional 4-6 years if the vehicle is equipped with an approved retrofit. This kind of retrofit will be an integral part of newly produced vehicles because otherwise it would be difficult to meet Euro 4 or Euro 5 emission requirements; what is more installing any other retrofit equipment on the same vehicle will then not be possible. The proposal for the new regulations will not allow any kind of exemptions for retrofitting of vehicles. The final proposal, which the four Swedish cities have agreed on, contains some exemptions. These exemptions are based on technical regulations, which officially cannot be enforced by a municipality. The close co-operation with the Industry Ministry has resulted in a proposal to amend national traffic legislation. The proposal for changes in the national legislation has been sent for consideration to 16 affected parties in September 2005. Changes to national legislation take time, and this has meant that the new

regulations could not be implemented by 01-01-2005, which was the planned date. The delay will probably be 18 months (01-07-2006). Information meetings for politicians have been held in September 2004 and February 2005.

Political barriers/drivers

Politicians were informed about the proposal for expansion of the Environmental Zone in March 2004, and a decision was made to send the proposal to 21 affected parties. 18 of these sent in a response. In September, the politicians were informed about the responses from the affected parties. The politicians were informed about the changes to the proposal for an expanded Environmental Zone in February 2005. Due to strong standpoints from external interested parties, the political decision has been delayed for approximately eighteen months. This also means delayed implementation of the expanded Zone. Since it is very important to have the same regulation in the four Swedish cities there are also difficulties to have the political support from each city. If there are problems to get political support in one of the cities it delays the process in the other cities. Strong lobbying is used towards the politicians for getting the transport companies' point of view. It has resulted in large delays and deviations from the original timescale.

Within a city centre vehicle traffic is one of the major sources of air pollution. It is in the interest of the municipalities to reduce air pollution as much as possible. The emissions from traffic effects peoples' health and therefore the costs for the emissions are high for the society. A regulation of the heavy traffic can give lots of benefits in reduced emissions. To implement an Environmental Zone is a good start from which the regulations can be up-scaled as in the case of Göteborg. A good lesson learnt is to involve affected parties as soon as possible, but also to include different kind of experts (do not forget experts in leadership and development-process). A study (Miljözon- en världsnighet från Göteborg, Ecoplan) shows that the people involved at an early stage are the ones most positive. It is also very important to have a realistic timescale. This kind of development takes time. Changes in legislation on national level are often combined with lots of lobbying and it is a time consuming work.

Lessons learned

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Financing aspects

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21-03-2006

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Last update:

4.11 Incentives for improving the load rate in inner-city freight distribution (Göteborg)

<i>CIVITAS Project</i>	Tellus
<i>Measure field</i>	Loading Zone, Distribution scheme
<i>Status</i>	Implemented
<i>Measure description</i>	The purpose of the measure is to introduce a pilot project in an inner-city part of the existing Environmental Zone in the city of Göteborg, with demands not only on emissions, but also the load factor of the vehicle. The pilot project is designed as a voluntary scheme in co-operation with the transport industry. Main design elements are i) definition of the demand on load rate for the vehicles; ii) definition of restrictions for entering the city zone; iii) development of a communication system to measure and report the load rates on the vehicles; iv) implementation of unloading areas for the companies that meet the defined criteria.
<i>Objectives, innovative aspects</i>	The goal is that the number of deliveries to the area should be reduced without introducing severe restrictions on volume of goods, availability or vehicle type. With reduced number of deliveries, positive effects on congestion and total emissions are expected to provide a more attractive city environment for the citizens as well as working environment in the long term.
<i>Implementation</i>	The criteria for entering the inner city zone for distribution vehicles should be a combination of a 65 % load factor and the time comparison between stop time and running time. This is a complement to the demands on emission levels in the existing environmental zone (TELLUS project 5.7). In the pilot project there will be eight vehicles involved for testing the system. However, all vehicles with a weight above 2,2 tonnes and more have the opportunity to join the project. The geographical borders are defined to include an area about 2 km ² inside "Vallgraven and Nordstaden", which is a part of the present environmental zone. Each vehicle will have a GPS installed for registration and control of the routes. A digital pen with Anoto functionality is used to register the load rate of the vehicles
<i>Results</i>	<p>The scheme started in December 2003 with 8 distribution vehicles in the inner city area. The vehicles are in different sizes (weight and volume capacity), with different customers and truckers to get a broad picture of the situation. During the first period of the scheme, there were no demands on load rate. During this time measurements were made on current load rate, distribution routes, number of stops, etc.</p> <p>The second step of the scheme started in April 2004, with demands on load rate and measurements of this. Incentives (loading and unloading zones, using public transport lanes) were initiated for the second part of the scheme.</p> <p>The long term results of the project are expected to be a reduction of vehicles operating in the area and a reduction of NO_x, SO_x and PM emissions from the distribution vehicles in the area.</p>
<i>Barriers and drivers</i>	Barriers of the measure have mostly been legal issues. One of the most difficult problems was and is the law on public authorities that says that

all information at public authorities has to be public. This means that all information that comes into the hands of the City of Göteborg is free for everyone to see. It might not always be easy to find the information, but if you know what you are looking for, the information can be asked for and it is possible to get a copy of specific documents. In this particular measure this is a problem because of the haulers' company secrets – the customers. The haulers do not want their competitors to know what and where they deliver goods and how much. Since the objective of this demonstrator is to find out this particular information, a way around this legal issue had to be found. It is possible to classify documents that are "under progress". But, it is not a guarantee that the information will stay classified for ever. The solution to the problem was to collect data through a database localised at a sub contractor company. Data from the vehicles did not include information about customers in any way and the information sent to the Traffic and Public Transport authority did just include information about if or if not the vehicle had managed to reach the load rate level of acceptance. In this way, no information about each hauler's customers did reach the Traffic and Public Transport Authority.

Another legal framework that has had to be considered discussing the measure is laws about neutral competition and equal treatment. It is not possible to implement restrictions that in some way do not follow the law of equal treatment for equal vehicles. Since this demonstrator has been a pilot project it is possible to experiment outside those restrictions (since the project was delimited to a certain period of time), but since the measure is planned to be implemented in a full scale version all possible problems had to be considered from the beginning.

In the measure it was found out that it is possible to implement positive incentives for vehicles that fulfil certain demands as long as nothing is taken away for others.

To find a suitable technical solution for the load rate reports was another barrier. It was difficult to find a solution that was both user friendly and cheap. Many different technical ideas were evaluated before the Anoto Pen was found.

Factors for success:

Communication has been the best factor of success in this demonstrator measure. Through meetings, interviews and workshops, the measure design has been discussed continuously during the complete project period. The communication has not only been between the project management and managers at involved companies – it has also contained a lot of discussions with personnel at the municipality, the drivers and other interested parties of the measure. The most valuable information exchange has been with the drivers of the vehicles.

Drivers to keep the measure going have been the enthusiasm of some of the drivers of the vehicles in the project. After the ending of the pilot project those persons have created a wish for a continuation of the project.

This measure has the potential to be implemented in other cities. One of the reasons to do this is the possibility to create a good relationship between the municipality and the haulers. With good communication about the scheme: the problems and the possibilities, this gives the haulers some positive attention. A common situation is that restrictions are implemented for heavy duty vehicles, like Environmental Zones, and no restrictions are implemented for private cars. This upsets the haulers since their reason for driving distribution vehicles inside city centres are the customer demand – they are just performing their job. If the haulers

Lessons learned

that make an effort to reach high load rates, choosing environmentally better fuels etc. are being noticed and given something in return, the relationship will be better between the parties and there will be better opportunities to create other demonstration measures further on. One surprising effect of measure was that, when discussing the future potential of the measure, the haulers suggested restrictions. Their solution to a better urban environment was to close some of the streets within the city and just allow certain, high performance vehicles, to enter those streets - a radical but effective solution.

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4.12 Introduction of clean waste collection vehicles (Göteborg)

Tellus

CIVITAS Project

Clean vehicles

Measure field

Implemented

Status

The demonstration measure was to introduce and evaluate a new type of CNG/CBG heavy vehicles for waste collection. Four innovative clean waste collection vehicles have been bought and operate in the central parts of Göteborg. Collection of municipal solid waste in Sweden is usually performed by diesel-fuelled trucks. Conventional waste collection with diesel-fuelled trucks is noisy, polluting and hence, adversely affecting the environment and disturbing many people during operation.

Measure description

The aim was to reduce environmental problems in terms of noise, water and air pollution, aligned with conventional waste collection in urban areas. The vehicles introduces an environmental and cost-effective approach to waste collection, which efficiently reduces noise, risks of hydraulic oil leakage, fuel consumption and emissions of NO_x, PM (Particulate Matter), HC, CO and CO₂.

Objectives, innovative aspects

Main activities that have been carried out:

Implementation Status

- Purchase of 4 clean heavy waste collection vehicles;
- Noise measurement of the vehicles in comparison to state of the art vehicles;
- Emission measurement of the vehicles in comparison to state of the art vehicles (CNG vehicles only);
- Evaluation of the environmental output;
- Dissemination of experiences and results.

The demonstration will consist of 4 vehicles from Mercedes Benz with additional equipment from Norba AB, which will run on a daily basis in the very central parts of Göteborg. Different types of environmentally friendly technologies are all gathered in one vehicle. The chassis has a six-cylinder CNG/CBG engine that automatically shuts itself at the collection stop. The bodywork is served with an electric powered engine and the traditional hydraulic oil will be replaced by a water solution consisting of water, propylene glycol and anticorrosive agent. The electric powered engine will in turn reduce the noise and emissions during the loading procedure, which represents about 60% of the total time. The chassis and engine are bigger than what has been developed before.

Measurements have shown that noise during „idling“ has disappeared and while loading been significantly reduced. When it comes to emissions of effluents they have decreased with 50-65 % (PM, CO, NO_x and CO₂) and by 9 % for (HC) compared to a conventional gas vehicle. Fuel consumption is reduced by 49 % and the consumption of electricity is 2 kWh/ton collected waste.

Results

Barriers and drivers

A barrier identified when introducing the clean vehicles was the high investment costs involved compared to conventional vehicles. Only considering a CNG and a diesel engine, the CNG engine is about 350,000 SEK more expensive. Furthermore, in order to apply electric hybrid technique and extra investment cost of about 270,000 SEK is added. Moreover the water hydraulics is about 270,000 SEK more expensive compared to traditional oil hydraulics.

But it should however be observed that the vehicles should be considered as prototypes. If they were to be introduced on a large scale, the investment cost would be significantly lower.

Another barrier identified involved the new technique implemented in the waste collection vehicles. Both water hydraulics and the electric hybrid technique are technologies that have been applied for the very first time on waste collection vehicles. As with all new technologies this has caused some unforeseen problems such as a reduced capacity of the water hydraulic systems, which was stated in the actual implementation process. The problems occurred have however been taken care of as a work of guarantee.

A major driver identified was the willingness of the municipality of Göteborg to consider the environmental performance of waste collection and to implement products and services, which are better from an environmental point of view although the initial investment costs are higher. Since the municipalities in Sweden have the responsibility for MSW collection and treatment, they set the regulations on how it should be performed and can thereby demand that BAT should be used.

Lessons learned

The clean waste collection vehicles have so far proved to accomplish waste collection with satisfactory productivity. This means that the implemented technique has been as reliable as conventional techniques. It can thus be concluded that the overall environmental performance is clearly superior to the conventional vehicles.

Another conclusion made is that the vehicles are best suited to operate in highly densely populated areas, characterised by long stops with respect to time at the different collection stops. That is waste collection where the collection stops are a significant part of the total operation.

The noise in densely populated areas has received increased attention in recent years. Studies have shown that high constant noise levels can cause health problems such as fatal heart diseases. One of the main advantages with the clean vehicles is the significantly lower noise level, why this technique can contribute to a better situation in cities.

Another important issue relates to the increased focus on work environment. The clean vehicles do offer a better working environment for the drivers, not only by the lower noise- and emission levels but also by the design of the cabin itself. The cabin is situated lower than in conventional vehicles, which makes the exit of the vehicle at each collection site less harmful for the drivers.

Financing aspects

A barrier identified of introducing the clean vehicles is the high investment costs involved compared to conventional vehicles, where an extra investment cost of about 100,000 EUR compared to conventional diesel vehicles was needed. As stated earlier it is however very important to consider that the vehicles should be considered as prototypes. If introduced on a large scale, the investment is expected to be significantly lower. The clean vehicles do however accomplish a lower fuel consumption. As the fuel cost is a significant part of the total operating costs, the technique does have a positive impact on the total life cycle cost. From the measurements carried out it could be

concluded that the clean vehicles do reduce the fuel consumption with up to 50 %. Statistics within Renova of the four clean vehicles in operation have shown that the annual average fuel consumption for one vehicle is about 9,800 nm³. Based on a CNG fuel cost of 6.9 SEK/nm³ (VAT of 20 % included) an annual reduction of fuel of about 68,000 SEK is expected. This compensates to some extent the higher investment costs. The benefits of a better fuel economy increase as the fuel costs currently rise at a high rate. It is however important to consider that the 50 % reduction was being measured during simulated waste collection procedures and not during real waste collection.

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Last update:

4.13 Consumer driven goods management from a Mobility Centre base (Göteborg)

<i>CIVITAS Project</i>	Tellus
<i>Measure field</i>	Innovative Soft Measures
<i>Status</i>	implemented
<i>Measure description</i>	<p>New companies and housing areas create larger amount of goods flow and together with the delivery trend for companies; same amount of goods delivered with higher delivery frequencies, is creating problems for the city. This will increase the demand for light and heavy duty vehicles on the roads and will also have a greater impact on the environment. This project will try to change this trend and make the consumers and suppliers more aware of the benefit of more organised distributions and contribute to building "the good city".</p>
<i>Objectives, innovative aspects</i>	<p>The demonstration measure focuses on consumer companies and makes them aware of their part in the logistic chain. The aim of the project is to establish contacts between wholesalers (of office material) and companies on the north bank of the river, and through a voluntary agreement between both entities decrease the number of transports in the area by 30%.</p>
<i>Implementation Status</i>	<p>This project deals with the difficulty of how a municipality can influence the private sector when it comes to transport of goods without imposing regulations. The project has used communication as a tool to find an answer to this question. 17 companies and 5 office suppliers in the Lundby area have been involved in the demonstration. Companies have been provided with company management information and free consultation on how to change their purchase and delivery routines in order for them to demand smarter deliveries. This scheme has been on a voluntary basis, helping the customer to re-negotiate delivery frequencies for office materials. It is thought to decrease the number of trips for deliveries by having orders for office supplies stacked.</p> <p>The measure has applied different communication tools, such as personal telephone calls and meetings, websites, seminars and workshops and different networks. During the project period three different workshops/seminars on the topic of goods distribution have been organised. In February and September 2004 and 2005 newsletters for companies were produced and distributed to 2500 companies in the Lundby district presenting companies with good mobility management behaviour as good examples.</p> <p>To change behaviour takes time since the logistic question is not given high priority at buyer companies. It is important to raise awareness before you can change their behaviour.</p> <p>There should be an economical benefit for the buyer companies in order for them to change their purchasing routines. This benefit could be offered by the involved wholesalers (that in the end gain from the new behaviour) and could take on the form of some discount on what they order.</p>
<i>(Expected) Results</i>	<p>The suppliers have gained a better understanding about the need to coordinate the deliveries in the area and thereby reduce the need for</p>

transports. The companies involved in the measure have decreased the frequency of their transports by an average of 41%. A few have not changed the frequency at all and the champion in this measure has decreased the frequency with 80 percent. In total the number of deliveries to the companies involved in the measure has decreased by some 500 deliveries, every year. Given this result it is expected that if a larger number of companies would be included in the measure, there would be a clearly noticeable effect on in the target area. Since the measure is based on voluntary agreements, it is a cost effective way of operating.

Barriers To change behaviour takes time and four years is a short period of time. While it was a quick process in getting each of the companies to implement changed behaviour, it took a long time to find interested companies for the measure. The project manager thought that the process to convince the company managements would go faster and smoother than what it did. The logistic question does not have high priority at the buyer companies. For that reason is it important to raise attention and information before you can change their behaviour.

Barriers and drivers

The wholesalers of office material have not marketed the measure to the extent that was expected from the beginning. Some of the wholesalers say that the competition is hard and as all the other wholesalers of office material are involved in the measure there is little uniqueness. The project manager has continuously tried to communicate the importance to work towards better delivery behaviour.

Drivers

The project manager is convinced that there should be an economical benefit for the buyer companies when they change their purchase routines towards less frequent delivery behaviour. The wholesaler who is the part that gains most in an economic point of view of the new behaviour should compensate the buyer companies and give some discount on what they order. This is something to bear in mind if there is a second step of this scheme.

One important conclusion is that the measure has been successful in establishing a way to decrease transport by strengthening communication between suppliers and customers. The majority of the 17 companies have decreased their frequency of deliveries between 30 and 80 percent. The objective of this demonstration measure was to decrease the number of transports of office material by 30%.

Lessons learned

It is possible to talk about the complexity of goods transport to the company management, but the priority in this area is very low. That is why it is important to present all the benefits and give the companies the reason why they should work more actively with this issue. It is important to use the right communication tools for opening up a dialogue with companies. Because few companies have joined the measure it is hard to demonstrate any measurable effect on emissions in the City, but the measure is very successful in establishing a working model with concrete and quite impressive results. By enlarging the model, and having more companies join, emissions would decrease.

To make this measure more attractive and faster implemented for the companies, stronger incentives are needed. The Lundby Mobility Centre has tried to make the wholesalers/ suppliers to give some discount on the price when companies are asking for less frequent deliveries, something that was not successful at this stage.

A master thesis discussed how to make a long-term freight cooperation system in an urban area to work and the conclusion was to arrange a reloading terminal at the entrance to the district. This terminal is estimated to rapidly decrease the number of distribution vehicles to the area. But is this a way the municipality wants to go? European examples from City logistic Centres shows problems with profitability and that the municipality more or less has to pay the extra cost. It can be argued that the current measure is more cost efficient.

The potential of transferability of this measure is high. The measure has a simple design with small initial costs. Small changes in the purchase- and distributions routines of the companies have a direct effect on the transport frequency. It is also a measure that improves the public and private cooperation. The measure is based on voluntary agreement and has no restriction to consider so it is quite easy to implement.

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4.14 Incentives for purchasing of CNG/CBG heavy duty and distribution vehicles (Göteborg)

Tellus

CIVITAS Project

Clean vehicles, Integrated Pricing Strategies

Measure field

Implemented

Status

Because buying CNG heavy-duty vehicles means making additional costs, not many haulage companies were interested in investing in this type of trucks. It is thought that with a set of tools this attitude might be changed. Furthermore, the financial contributions of TELLUS make it more attractive to introduce these trucks. And the subsidy will also make it possible to adapt a CNG fuelling station in order to increase traffic.

Measure description

The objective of this measure is to decrease emissions of NO_x and particles from heavy-duty and distribution traffic in the city of Göteborg. This should be realised through influencing private companies to use clean HD and distribution vehicles. Increasing heavy and distribution traffic is a major problem for city planners, both from a pollution and health aspect, and from a congestion aspect. Already many substances exceed the air quality norms that will be legally binding from 2006. Within the project the goal is to introduce 10-15 lighter (app. 3.5 tonnes) and 2-3 heavy distribution vehicles (18 tonnes).

Objectives, innovative aspects

The measure was introduced by FordonsGas, a Göteborg distributor of CNG/ CBG for vehicles. FordonsGas encountered several problems, among which was the absence of suitable vehicle models on the market (especially in the heavier segment), and the difficulty of involving companies within the measure. A solution was found: during the project FordonsGas was joined by DHL, GreenCargo AB (both international logistics companies) and Gatubolaget (specialised in transport in the Göteborg area). These three companies have purchased clean distribution vehicles that are utilised in their everyday business. The three partners have different characteristics and FordonsGas, the distributor of CNG/CBG, have set up measures in co-operation with every one of them.

Implementation Status

DHL: To support commercial implementation logistics company DHL can run the trucks in their ordinary transport system. By introducing a product called "Green Tonnage", DHL offers its clients the possibility of buying almost carbon dioxide free transports. The CNG heavy-duty trucks and distribution vehicles will generate these transports, as they will be fuelled with biogas in accordance with the green gas principle. The result is transport with a reduction of up to 94 % CO₂ emissions as well as low emissions of NO_x and particles. The additional transport cost per tonnage kilometre is only € 0,02. If all of DHL's customers who buy land-based transportation in Sweden selected the Green Tonnage option for 10 % of their transportation needs, this would result in a reduction of carbon dioxide emissions of around 28,500 tons per year.

GreenCargo AB will also offer their clients the possibility of buying almost carbon dioxide free transports. They are discussing with dedicated customers who have shown a high interest in improving their transportation situation into cleaner distribution. Gatubolaget has purchased 10-15 lighter distribution vehicles and used them in their daily operation.

(Expected) Results

The measure has resulted in one fuelling station, 16 distribution vehicles (Mercedes Sprinter and Ford) and 2 heavy-duty vehicles (Scania and Mercedes). The fuel station has delivered 660 000 Nm³ CNG since it was opened in March 2003. The vehicles have decreased CO₂ emissions by 72.8 tons and NO_x by 83 kg. The vehicles will within 1 year's time drive app 500,000 km on CBG instead of diesel. The project itself shows how actors from different parts of the chain of transportation can co-operate to change directions from conventional distribution to new environmentally friendly ways of distribution.

Barriers and drivers

Barriers

- Lack of refuel stations for clean fuels. It is expensive to expand the infrastructure for CNG/CBG. The cost of one station is 200,000-450,000 Euros;
- Lack of suitable vehicle models. There are not enough models on the market. To be able to reach the required breakthrough, more models are needed;
- High purchase costs and a weak second hand market. The higher price and the uncertain second hand market is a high risk for contractors. The transport contractors are pressed financially already. Transports are too cheap;
- Lack of real long-term political commitments on tax reduction and infrastructure investments. The long-term perspective is necessary to carry out changes.

Other problems are the facts that private drivers and small haulage contractors are financially vulnerable and are consequently difficult to convince about NGVs. The price setting of used vehicles and the uncertainties of future taxations, rules and laws concerning NGVs are issues that are obstacles in convincing them.

Drivers

- New attractive high-tech clean vehicle models are available on the market. The activities to make more models available on the Swedish market are important in order to reach a market breakthrough. The purchaser needs a selection of at least one model from each manufacturer;
- Reduced tax on the private use of company cars and possible local incentives such as free parking, are important drivers. Without these there would be very small number of clean vehicles on the street;
- Increased awareness of the greenhouse effect and oil dependency. The oil price is increasing. CBG is produced locally and has low net values of green gas emissions. Another positive aspect is that the business cycle for CBG is not as sensitive as the oil cycle;

- Environmental requirements in public procurements of transport services. This driver is a wake up call for the market. The public procurement requirements and goals are raised. Göteborg has decided to exchange their vehicles in the municipal fleet to clean vehicles. Their target is that 90% of all vehicles, transports and deliveries should be clean vehicles by the year of 2008.

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October 2005

Last update:

4.15 Green city logistics (Graz)

<i>CIVITAS Project</i>	Trendsetter
<i>Measure field</i>	Fleet management & route planning, Distribution scheme
<i>Status</i>	Implemented
<i>Measure description</i>	<p>The project aims to consolidate retail goods to shops and was performed in two stages. Before starting the actual project some specific analyses and research were carried out by the project management company ECE.</p> <p>The actual pilot project begun in the second stage, where ECE could start the project with two big partners – ITG as forwarder, located with its warehouses at the southern city border, and Kastner & Öhler (K&Ö) as the biggest shopping centre of the city. The project organized the consolidation of daily deliveries to the shop-in-shop system of K&Ö during a phase of construction of a five-level garage beneath the department store. The transports from an external warehouse to the shopping centre were carried out by low emission vehicles. The system has been installed as a permanent solution after the Trendsetter project period.</p>
<i>Objectives / Innovative Aspects</i>	<p>The Green City Logistics measure aims at improving logistics efficiency and thereby achieving the following objectives:</p> <ul style="list-style-type: none"> • Improved exploitation of freight capacities; • Reduction of trips and stops; • Reduce noise from distribution traffic in sensitive urban and hospital areas; • Reduce fuel and energy consumption and emissions of CO₂, NO_x and particulates.
<i>Implementation Status</i>	<p>Two logistics systems were actually realised.</p> <ul style="list-style-type: none"> • One involved the reorganisation of the entire distribution system of the largest department store of Graz. Goods were consolidated in a distribution centre outside Graz and efficiently transported in containers to the store. The containers were used to transport waste material out of Graz. • The second project was the deployment of electrical vehicles for distribution purposes in the narrow streets of the city centre, especially during large construction works at the city tramline.
<i>(Expected) Results</i>	<p>The expected results from the project were a 70% reduction in traffic mileage and a corresponding reduction of emissions and energy. The real reduction of vehicle kilometres was 56% with a corresponding reduction of emissions and energy use. The noise levels are the same before as after the project (since the number of vehicles is low and the noise mostly consists of ordinary "city noise"). The load factor indicator is not reported, since there was no possible way to measure this in a reliable and accurate way.</p> <p>It was intended to implement the consolidation of goods through a cooperation of many forwarders and shops. As the target is (almost) achieved with only two large companies, the number of vehicles is low. But, the project will be a core project for the newly founded "city marketing company" (shareholder is the city of Graz) as a showcase for shop owners participating in this supply chain.</p>

There is low knowledge about logistics as most of the shop owners receive their goods free to the door, so they do not know the real transport costs. The suppliers are reluctant to change their system because they might lose money. This is a barrier, since the shop owners do not see any cost reduction with consolidated transports. With pilot projects, financed for one year by the city of Graz, the effects and benefits for the shops can be showed.

Barriers and drivers

Drivers for this project are the benefits:

- The consolidation of goods achieves a minimising of the number of vehicles and transports in the city – helping to create a better and safer urban environment, and may be used as marketing factors for inner city shops.
- Transports will not be performed during peak hours in the city – this reduces problems especially in pedestrian zones.
- The working environment in shops is better: having just one delivery per day is more convenient.
- The costs are not higher.
- Value added services are possible.

Another driver of the project would be if the municipality would enforce the regulation about time limited transports within the city. There is a regulation for private cars and transportation vehicles before 11 o'clock, but this regulation is not kept and is not controlled seriously either. If it was, the benefits of a consolidation scheme would be more obvious.

Initially, such a project requires financial support from public funding to cover the costs for necessary preparations. The cost benefit results are achieved through the reduction of vehicles and trips by full loading. Additional costs which may be caused by the transshipment can be minimised by offering additional value-added services. The single costs for the change of the supply-chain of small shops should be supported by the city or the city marketing company.

Financing aspects

The logistics project will continue after Trendsetter with the shop-in-shop concept in K&Ö. This means that many shops will benefit from the project. The company ITG already makes a profit from the project (March 2005). ECE has made a suggestion to the local government for financing a one year project to show the effects of the logistics project to owners of small shops. The results will hopefully convince some of them to join a project like this. The costs for the shops will be the same, but they may benefit from easier goods handling with just one delivery per day and they will be offered value added services.

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Last update:

4.16 New goods distribution scheme (Krakow)

CIVITAS Project

Caravel, CIVITAS II

Measure field

Distribution scheme

Status

Ongoing

Measure description

The City of Krakow will develop a new scheme of goods distribution with usage of clean and more environment friendly vehicles. Initial implementation will be made within the city centre on the main square area. With the goods distribution system, the private delivery service in the old city centre shall be reduced by about 50%.

Objectives, innovative aspects

The measure concerns the developing of an access control system for goods vehicles to protected zones, the establishing of a efficient goods distribution, the achieving of a wide social consensus on access restrictions and the implementing of a system operated by clean vehicles. Innovative are the integrated implementation of an enlarged freight distribution system, the extended set of goods distributed and services offered to the customers and the access control technology and clean vehicles.

Implementation

Implementation has not started yet.

The City of Krakow will develop a new scheme of goods distribution with usage of clean and more environment friendly vehicles. A feasibility study concerning the system for the distribution of goods in the city centre of Krakow, using clean and energy efficient vehicles will be taken. Initial implementation will be made within the city centre on the main square area. With the goods distribution system, the private delivery service in the old city centre shall be reduced by about 50%. Within the urban goods distribution system, the particular objectives shall be achieved which are the improving of the regulation on access control of private commercial vehicles in the inner city area in order to decrease the amount of private goods deliveries and the building up the concept design of the goods delivery system. Research and technological development activities are conducted concerning the design of the scheme of the goods delivery concept in Krakow, the planning layout and the operations of the logistic centre, linking with this activity also the involvement of present couriers, operators, and of all potential stakeholders in the decision-making process.

(Expected) Results

Among the expected results and targets that can be easily verified are the reduction of goods vehicle traffic in the demonstration area by 50%, the increasing of free space for pedestrians, the improving of the environmental situation and the obtaining of the acceptance level of shopkeepers above 65%.

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4.17 City Logistics Strategic Extension (La Rochelle)

Success, CIVITAS II

CIVITAS Project

Distribution scheme, Clean vehicles / clean fleet

Measure field

Ongoing

Status

This measure aims to enlarge the city surface covered by controlled city logistics and to define the associated clean vehicles.

Objectives and measure description

The first sub-objective will be to define of what is the real area of "city logistics", what are the physical, managerial boundaries which may already exist or have to be drawn between industrial supply chain and city logistics. In medium sized towns, these limits are quite loose and it will be necessary to give authorities a method based on experiment for defining them.

A second objective will be to build a methodology for developing a systemic approach of goods transportation in cities and to design associated tools. This will lead to a better control of the whole evolution of this system.

The idea of consolidating goods on the urban periphery for subsequent delivery to retail outlets has been explored since the 1970's but has never been very successfully implemented. Perhaps the best examples are the 'City Logistics' concepts in Germany, which have been established through domestic freight forwarding companies, but are not driven primarily by environmental concerns. Moreover, a global systemic approach of all actors transporting goods in a city has not been started yet.

The Elcidis experiment, one of the first examples of such implementation in Europe, did not reach all the expectations. The knowledge gained through these 3 years will allow the city to draw up a better strategic plan and to design a methodology for implementing such "city logistics" approach in similar medium-sized towns.

The works will start with the detailed analysis of the requirements and behaviour of the stakeholders and the identification of the already applied measures, in La Rochelle and in different similar places.

Implementation

This will lead to the elaboration of the strategic goods distribution plan, which will contain the actions to be launched and their priorities:

- Investigation on the localisation of the Best places for access control for distribution vehicles in space (circulation of vehicles) and time (specific delivery hours), which is in link with measure on access control;
- Installation of several specific urban delivery zones (at least 3 will be installed in city centre where retailers will come and fetch their parcels);
- Localisation of new boundaries to the main commercial surrounding zones;
- Definition of specific regulation for control access zones;
- Test of new delivery vehicles;
- Global assessment and control on pollution impacts.
- Elaboration of a methodology (and associated tools) to optimise the development of goods distribution in medium sized towns based on capitalised knowledge.

The activities for achieving these actions will begun with the definition of an extension plan (time and space) and adequate resources (clean

vehicles) and planning of actions (priorities, costs and time aspects). This extension should cover several towns in the La Rochelle Community. This will be based on the formalisation and analyse of requirements, behaviours of all types of users and on the identification of constraints (technical, sociological, from different actors...) and specific interest.

This will lead to the definition of the city logistics models according to these requirements and constraints and their mixing together and the elaboration of a set of different possible solutions for organising and implementing goods flows (technical and socio economical evaluations).

(Expected) Results

- Increase the efficiency of goods distribution in the city leading to a reduction in goods vehicle traffic;
- Secure delivery zones;
- Specific traffic hierarchy and regulation for goods distribution;
- Reduction of emissions through the introduction of clean vehicles;
- Involvement of all partners in the search of solutions.

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4.18 Customers services associated to goods distribution (La Rochelle)

Success, CIVITAS II

CIVITAS Project

Distribution scheme, Clean vehicles / clean fleet

Measure field

Ongoing

Status

ELCIDIS activities were a first test for introducing such new services in the scope of controlled goods distribution. However, although it was rather successful, this was constrained by the nature of vehicles and the area covered by ELCIDIS. The objective is to extend this type of service towards other domains and involve new partners.

Measure description

The aim of this task is to decrease the traffic flow linked to goods transportation in organising optimising different services to the customers. This will lead to the development and implementation a range of new services realised by private or public operators. Goods distribution concerns mainly transportation of parcels. The innovation will concern new customers services directly linked to logistics flows.

Objectives, innovative aspects

Transporting goods from outside to city centre (and reverse) is the base of goods distribution but does not represent all the logistics flows. Added value must be looked for in other transports and with retailers and craftsmen in order to improve the economic and environmental sustainability of the whole system. This added value may come from new services delivered by goods operators and may concern for instance:

Implementation

- Recycling packaging;
- Using clean vehicles to deliver the goods;
- Delivering goods at P+R : people leaving their car for work will find the shopping they ask for when returning to their car;
- Delivering fresh vegetables and fruit, fish from outside wholesale markets;
- Providing goods transport inside towns between trades (ex dry cleaner and restaurants, flower shop and individuals,... - BtoB or BtoC realistic and practical links!!!);
- Deliver individuals from hyper or super markets by bus.

To define and launch these actions, a strategic plan will be elaborated in collaboration with the main actors and updated every 6 months in order to analyse the results and eventually adjust the action and to determine new actions and services.

This will also allow to precise if such logistics may be realised by specialist carriers or generalist ones.

(Expected) Results

- to bring new services in the city for transportation of goods;
- to reduce the number of goods carriers and light utilitarian vehicles in the centre;
- to reduce emissions through the introduction of clean vehicles;
- to involve all partners in the search of solutions.

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4.19 Development of partnership with logistic operators (La Rochelle)

Success, CIVITAS II

CIVITAS Project

Public private co-operation, Distribution scheme

Measure field

Ongoing

Status

This set of tasks aims to encourage all actors in city logistics, from the individual to shops owners to participate actively in the optimisation of city logistics activities in all the supply chains involved in these domains. The most innovative aspect will be the participation and the set up and validation of a methodology to involve partners. This will also lead to a better knowledge of basic parameters in goods distribution.

Objectives and measure description

First attempts have been made with different actors in order to make them aware of the necessary evolutions in goods distribution. These actions have to be emphasized at a large scale for all the categories of actors, which is now made possible by Elcidis project.

Actions will be quite varied in their format. The main thrust will focus on the following:

Implementation

- All traders from retailers to hyper market managers need to be motivated to use the system for themselves or their customers;
- Specific incentive measures for craftsmen, SMEs mainly working in town will be elaborated to convince them to invest in clean vehicles (for example negotiate special discount prices with local car vendors);
- Private goods carriers will be encouraged to use clean vehicles (see WP1) and helped to coordinate their deliveries;
- Specific agreements with carriers will be set for clean goods distribution modifying several behaviours from delivery hours, up to at most coordination between them (Goods quality agreement).

To achieve these actions, the activities will be based on deep cooperation with all the involved partners in order to identify clearly the behaviour and requirements of the different categories of actors (working groups) and to define possible incentives or rules for goods distribution for each.

This will lead to the development of a specific marketing and communication planning in which various documents will be produced, like leaflets, and other documents for promoting the goods distribution system.

Another activity will lead to the launching of a freight forum to demonstrate, explain and encourage best practices. Results will be analysed and evaluated.

(Expected) Results

SUCCESS will contribute to

- foster the cooperation between logistics operators in CdA La Rochelle;
- increase the use of clean vehicles for goods distribution and
- improve the behaviour during delivering.

Last update:

26-07-2007

4.20 Car sharing for business and private persons (Malmö)

Smile, CIVITAS II

CIVITAS Project

Car sharing

Measure field

Ongoing

Status

Five car sharing sites will be established, one of them having at the same time the public, businesses and public organisations as customers. The car sharing sites will offer an accessible way to use and experience clean vehicles.

Measure description

The aim is to provide people, companies and organizations an access to environmentally sound vehicle and flexible transports - wherever and whenever needed. Car-sharing is like having your own car - without owning one. One goal is to establish five car-sharing sites in the city of Malmö for different kinds of users. 40% of fuel used should be of an alternative nature after 18 months, increasing to 50% after 24 months. But also to show that clean vehicles are ordinary vehicles that anyone can use.

Objectives, innovative aspects

As no commercial car-sharing alternatives exist in Malmö today, we will start five different car-sharing sites with totally 15 cars. To be able to test the use by different kind of users, we will offer companies, public and Malmö Central station pool-sites. We will also establish one mixed city-pool for both companies and public. All cars will be environmentally sound cars.

Implementation

- Site 1 and 2. Establish two smaller business-only car-sharing sites and ensure that the customer companies are significantly different with regards to type of activity, travel patterns and staffing in order to be able to evaluate the influence of the differences.
- Site 3. Establish a public-only car-sharing site e.g. a housing estate, possibly in partnership with a housing company.
- Site 4. Establish a car-sharing site at the Central Station in Malmö, possibly in partnership with Skånetrafiken.
- Site 5. Establish a larger car-sharing site in central Malmö with businesses, local authority activity and the general public at the same site. In this way it is possible to compile an interesting mixture of users with varying expectations and circumstances.

The first SunFleet car sharing site for companies and the public was opened in 2005 close to the Malmö Central Station. In 2006 the second car sharing site was established in the area of Western Harbour. During 2007 two additional car sharing sites were opened in the inner city. In the summer of 2007 a total of 7 cars from SunFleet will run. By summer 2008 all 5 car sharing sites are expected to be operating.

(Expected) Results

Less private cars are needed and fuel consumption decrease: The environmental impact will decrease by the use of clean vehicles. Lower emissions of hydrocarbons, CO₂, NO_x and particles will be one effect of the project.

Improved safety: The cars that are replaced by car-sharing cars are often old and unsafe. As Sweden has Europe's oldest vehicle fleet, this is a significant benefit in work to decrease serious road accidents.

Social equity in car use: Social groups who cannot normally afford to use a car can experience improved quality of life through the opportunities that an environmentally aware car pool can offer for some journeys.

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4.21 Clean heavy vehicles with CO2 cooler (Malmö)

Smile, CIVITAS II

CIVITAS Project

Clean vehicles

Measure field

Ongoing

Status

The local dairy company, Skånemejerier, will replace 10 of its heavy diesel vehicles with similar natural gas vehicles with CO2 coolers between 2005 and 2008. When purchasing natural gas powered vehicles these will be equipped with cooling systems with CO2 as a coolant. The advantages are many, some of which are - CO2 system is quieter, only the fan is audible.

Measure description

16 drivers will also be trained in heavy vehicles eco driving. Eco-driving is a way of reducing fuel consumption by 10-15% by learning a more efficient, adaptive and safe way of driving. Eco-driving requires no investment in equipment, since practically all new cars include technology that allows for eco-driving. In this measure eco-driving for heavy vehicles is taught to 16 drivers, with repetitive training each year to get the best result.

This activity will be carried out with the aim to achieve a lowest possible environmental impact from the farm to the customer.

Objectives, innovative aspects

The emissions of CO2 will decrease by 62%, the NOx emissions by 69% and small particulate emissions with 79%. The fuel consumption will decrease by 10% between 2005 and 2008, the base year for all these numbers are 2004.

The first 5 lorries have been introduced in service. The EcoDriving training has been held according to plans and has been repeated for different drivers over the span of the project.

Implementation

Within the framework of the project 2005-2008, the environmental impact of vehicle emissions (nitrous oxides, hydrocarbons, carbon dioxide and particulates) will be reduced as 10 Euro class II vehicles will be replaced by natural gas vehicles.

(Expected) Results

By profiling the natural gas vehicles and provide them with fuel information, both the general public and other companies will perceive Skånemejerier as a branch leader. Lower noise levels compared to diesel distribution vehicles will benefit the general public as well as the drivers

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Last update:

4.22 *Extended environmental zone for heavy vehicles and enforcement (Malmö)*

<i>CIVITAS Project</i>	Smile, CIVITAS II
<i>Measure field</i>	Access management/ Enforcement
<i>Status</i>	Ongoing
<i>Measure description</i>	An extended environmental zone for heavy vehicles will promote cleaner transports. Traffic wardens are intended to be used for enforcement. This requires a change in national law, so this measure includes activities for influencing the national government.
<i>Objectives, innovative aspects</i>	Measure objectives are to extend the environmental zone to a larger area in Malmö, promote stricter regulations for heavy vehicles and to test new ways of enforcement of compliance. In order to create efficient access restrictions co-operation between different actors as the municipality, Stockholm, Göteborg, Lund, transport organisations and national bodies is important. In this measure innovations are also related to new ways of enforcing and evaluation the compliance.
<i>Implementation Status</i>	<p>The new Swedish legislation on LEZ was introduced on the 1st January 2007. The extended LEZ of Malmö was introduced in September 2007. Information has been sent out to media and the businesses. Together with the police the enforcement will be ensured.</p> <p>The area for the new environmental zone will carefully be planned for and possible environmental and economic consequences evaluated. This extended area will be chosen after studies of heavy traffic patterns.</p> <p>Task 1 - Planning for a larger zone Task 2 - Stricter regulations for heavy vehicles Task 3 - Information campaign about larger environmental zone and stricter regulations for heavy vehicles Task 4 - Influence the law to improve the surveillance Task 5 - Enforcement of the new environmental zone</p>
<i>(Expected) Results</i>	The activity is expected to lead to high rate of compliance and thus significant reductions in the emissions from heavy vehicles in Malmö. Expected results are at least 95% compliance of the regulation
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<i>Last update:</i>	27-05-2008

4.23 Heavy Eco Driving (Malmö)

Smile, CIVITAS II

CIVITAS Project

Mobility management for companies, Eco Driving Training

Measure field

Ongoing

Status

Malmö Lastbilscentral, Malmö Lorry Centre, will create and develop a completely new company and vehicle oriented training programme based on existing certified Heavy Eco driving courses. Their drivers will receive the newly developed training package to reduce environmental impact and economic costs.

Measure description

A newly developed carefully tailored training package for 200 drivers in Heavy Eco-Driving will enable Malmö Lastbilcentral (MLBC) to decrease fuel consumption by 17% of total fossil fuels used in the business. This will result in a decreased use of diesel of 1 070 000 litres per year, the equivalent of c. 2 675 000 km. Emissions of the greenhouse gas CO₂ will decrease by 2 792 700 kg in Malmö.

The measure objectives are to develop sustainable transport solutions in Malmö with the lowest possible environmental impact, highest road safety and health and safety. But also to train the drivers in this adapted and newly developed training package so they will receive professional development to drive more environmentally and economically efficiently.

Objectives, innovative aspects

All drivers in the measure have now received EcoDriving training with good results. A few more drivers will receive complementary training autumn 2008. The results will now be evaluated.

Implementation

Decreased fuel consumption by 17 %.

(Expected) Results

- Decreased emissions of greenhouse gases and harmful substances
- Increased road safety
- Improved health and safety at work
- Increased commitment to environmental issues

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27-05-2008

Last update:

4.24 Freight driver support (Malmö)

<i>CIVITAS Project</i>	Smile, CIVITAS II
<i>Measure field</i>	Fleet management & route planning
<i>Status</i>	Ongoing
<i>Measure description</i>	<p>Malmö Lastbilscentral, Malmö Lorry Centre, will establish vehicle and driver support as a new concept to get a more efficient transport planning. The measure aims at installing vehicle computers in 100 of their heavy lorries. Within the CIVITAS SMILE project, Malmö LBC will educate all their drivers in heavy eco driving.</p>
<i>Objectives, innovative aspects</i>	<p>The measure will establish vehicle/driver support as a new concept enables an efficient and optimal transport planning with a minimized environmental impact on citizens and nature in Malmö. The aim is to install vehicle computers in 100 heavy lorries during the project period. Malmö LBC with its 200 individual businesses will be the largest organization in the transport sector to influence its businesses and take the initiative for a more sustainable traffic situation in Malmö.</p> <p>Several positive effects will be seen by installing specific vehicle computers in 100 lorries such as</p> <ul style="list-style-type: none"> • More efficient transport planning of vehicles. • Increased level of loading of goods on vehicles. • Fewer unloaded kilometres driven. • Improved coordinated goods distribution. • Faster and more efficient order processing with a decreased number of mistakes. • Increased efficient partnership with other players in the transport sector. • Improved working environment and safety for drivers. • Optimized reporting and evaluation of significant environmental impacts. • Efficient and resource-efficient evaluation of the specific needs of customers. <p>Different business areas and areas of operation will be studied and evaluated to provide a basis for future investment and measures in the transport sector.</p>
<i>Implementation</i>	<p>During the first procurement process none of the suppliers could provide what Malmö LBC was requesting. Now 8 vehicle computers have been installed and are running in the lorries. A further development of the computers will be done jointly with the provider after a year of testing.</p>
<i>(Expected) Results</i>	<p>Malmö LBC expects to decrease the number of un-loaded journeys in Malmö. This will lead to decreased emissions of the greenhouse gas CO₂.</p>
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4.25 Satellite based traffic management for SME's (Malmö)

Smile, CIVITAS II

CIVITAS Project

Fleet management & route planning

Measure field

Measure is completed and closed

Status

Using the GPS (satellite) and GPRS (mobile phones) techniques a small delivery firm will be able to optimise transports and reduce unnecessary trips. The control centre will get updated positions of the vehicles twice a minute, enabling them to deal with fast unplanned city distribution.

Measure description

The objectives are to install a satellite based system in the delivering cars and vans and to reduce pollution, fuel and other unfriendly chemicals. The measure will also lead to change in the environment for the traffic-dispatch in form of less stress and more control.

Objectives, innovative aspects

Developments of new technique that easy and quickly can report the environmental benefit of co-ordinating the freights. The measure has a high demonstration value for SME's dealing with fast "unplanned" city distribution.

A satellite based system has been installed in delivering cars and vans. This was followed by installation of handhelds, for a more efficient two-way communication between the traffic-dispatch and vehicles. Developments of new technique that easy and quickly can report the environmental benefit of co-ordinating the freights.

Implementation Status

GPS-positioning system has been purchased and installed in 20 vehicles and during this process the traffic dispatch was educated. Three parts are included in the satellite-based system: Positioning, Communication and Registration. By combining GPS technique with existing programme for logistic and new software, the frequency for co-ordination of goods has increased. It is also possible to report the environmental benefit for each of the costumer that will be made by the co-ordination. The GPS system was installed in November 2005 and has been a huge success. The average driven distances have been lowered and the coordination on the delivery cars has improved radically. The staff is very satisfied with the new tools. The measure is now completed and closed.

The new system provides the opportunity to increase the chances for co-ordination by about 100%. The environmental effect is difficult to calculate but will lead to a decreased emissions of climate changing gases and particles and other combustion products. It will also lead to fewer vehicles on more tasks, which leads to lower use of tire and vehicle chemicals and lower wear on infrastructure. Less paperwork through transfer to digital media

Results

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30-05-2008

Last update:

4.26 Sustainable SME logistic for the food industry (Malmö)

<i>CIVITAS Project</i>	Smile, CIVITAS II
<i>Measure field</i>	Distribution scheme
<i>Status</i>	Ongoing
<i>Measure description</i>	A common food logistic system will be developed dedicated to link 40 - 50 food producers with 5 purchasers in the region. The project which is first of its kind in Europe will be owned and operated by the partners involved and aims at developing a cost and environmentally efficient regional shared transport system.
<i>Objectives, innovative aspects</i>	The measure will develop one common food logistics system dedicated to linking 40-50 food producers in the region with 5 purchasers in Malmö in order to develop a cost efficient and environmentally efficient regional shared transport system. The project is the first of its kind in Europe in which modern IT technology is used to create a professional market place dedicated to the regional food industry, and which is owned and operated by the partners involved.
<i>Implementation</i>	<p>The City of Malmö will develop an open source logistics system which will enable businesses in the city to order products directly from producers/suppliers in the region and get these delivered in an economically and environmentally efficient way. An IT based logistics tool containing seasonal planner, ordering and confirmation and logistics co-ordination system will be developed. A training programme will be developed and implemented for all businesses included in the system to ensure the smooth operation of the logistics system. The logistics operator will convert/change 5 vehicles to operate on cleaner fuels.</p> <p>Some of the actions are:</p> <ul style="list-style-type: none"> • Advanced analysis of current supply and demand and development potential and product flow analysis • Development of regional IT based logistics tool containing seasonal planner, ordering and confirmation and logistics co-ordination system. • Development and implementation of training programme for all business included in the system to ensure the smooth operation of the logistics system. • Specific support with quality management and time management to meet the demands for efficient logistics. <p>The web based solution is programmed and connections have been established with several farmers and business within the system. Several producers have adopted the system which will be officially released in summer 2008.</p>
<i>(Expected) Results</i>	The creation of a functioning regional logistics model providing environmentally efficient transport solutions for SME in the food sector. Once established, the system can grow in accordance with the

developing supply chain in the region and can easily be transferred and adapted to other regions.

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Last update:

4.27 Customised traffic and travel information service for freight operators (Norwich)

CIVITAS Project

Smile, CIVITAS II

Measure field

Travel information

Status

Ongoing

Measure description

The measure involves the provision of a higher level of information specifically directed at freight operators, and linked to their willingness to work in partnership to adopt clean urban principles.

A premium customised traffic and travel information service will be implemented for freight operators who are prepared to use clean and energy efficient goods vehicles in the urban area. This will act as an incentive to adopt clean vehicle technology. A limited amount of traffic information is already made available to all freight operators and other transport system users, through a variety of media, e.g. on street signage, internet, mobile phone technology, radio and TV broadcasting. The premium service will draw on information available through Norfolk's integrated Urban Traffic Control Centre.

Objectives, innovative aspects

The main objectives are to:

- assess freight operator desire to participate in the project,
- establish freight user needs and priorities with regard to service information,
- get a number of freight operators to adopt clean urban principles in return for user information,
- assess benefits and dis-benefits to the operators of the user information and adopting the clean urban principles.

Implementation

For the first half of the project this measure proceeded with the aim of determining freight operators interested in participating with them. This involved:

- Setting up web based virtual exhibition
- Adverts of logistics magazines for the web site
- Writing to 700 operators (locally and nationally) asking them to view the site
- A downloadable reply form for operators to express an interest.

From the previous work the interest of operators in this measure was lower than expected, however 6 companies expressed already an interest in participating. Following further consultation this has now been narrowed to two companies considered for implementation of measure activities. The aim is to provide the traffic and travel information in return for their drivers undertaking eco-driving training. Next steps include determination of operator's information requirements and whether these can be met technically. Customised Data Viewers have been installed into the depots of the 2 operators that provide information on events on the highway via the internet. The operator's use of the data viewers is monitored and further modifications according to customers' needs will be introduced.

(Expected) Results

This element of the work package will be used to demonstrate the willingness of freight operators to access better information, which could

be to their commercial advantage, by working in partnership to meet clean urban transport objectives.

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Last update:

4.28 *Development of Strategic Freight Holders Club to Deliver Improved Efficiency of Freight Operation in the City Area and Effect Improved Air Quality in Urban Areas (Norwich)*

CIVITAS Project

Smile, CIVITAS II

Measure field

Public private co-operation, Fleet management & route planning, Clean vehicles / clean fleet

Status

Ongoing

Measure description

Dialogue, co-operation and willingness to work towards common aims has traditionally been lacking in urban freight transport planning. This element of the work package aims to demonstrate whether better results can be achieved.

A freight stakeholder group will be established which can work together to develop a strategic freight initiative in the Norwich urban area and demonstration projects based on clean goods vehicles will be implemented. This work package is a means to demonstrate the extent to which the establishment of a stakeholder group can help to meet urban freight objectives.

Involve key private sector haulage, logistics and freight distributors, together with freight shippers and receivers to establish delivery and collection needs and means by which this activity can be made more efficient with reduced vehicle emissions and fuel consumption in respect of each tonne of freight moved.

Task 1: Establish strategic freight stakeholder group and identify user needs. Additional staff will need to be employed.

Task 2: Work with strategic freight stakeholder group and identify demonstration sites where the results of the integration of resources can be demonstrated.

Task 3: Initiate procedures to obtain necessary statutory orders.

Task 4: Develop and implement statutory procedures to facilitate continued development of new working practices.

Objectives, innovative aspects

The measure will enhance the dialogue between urban freight providers, users and local authorities, and develop a medium-term clean transport goods vehicle strategy initiative.

A demonstration site in a retail area will allow enhanced access for clean and energy efficient goods vehicles. The measure will demonstrate the extent to which the establishment of a stakeholder group can help to meet urban freight objectives.

Implementation

For the first half of the project this measure proceeded with the aim of determining freight operators interested in participating with them. This involved:

- Setting up web based virtual exhibition
- Adverts of logistics magazines for the web site
- Writing to 700 operators (locally and nationally) asking them to view the site
- A downloadable reply form for operators to express an interest

Now this has been completed and details of interested operators have been obtained the measures within AP10 will be implemented separately - although they are still closely linked.

Due to low number of interested operators the role of the club has changed. It will be used to promote the transshipment centre, improve dialogue between operators/local authorities, and provide a freight view into key consultation issues.

About 8 companies expressed an interested in forming a club. Aiming to involve these freight operators in the latest review and update into the Local Transport Plan for Norfolk.

This work package is a means to demonstrate the extent to which the establishment of a stakeholder group can help to meet urban freight objectives.

(Expected) Results

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4.29 Goods delivery to Park & Ride Sites (Norwich)

CIVITAS Project

Smile, CIVITAS II

Measure field

Fleet management & route planning, Distribution scheme

Status

Implemented

The Shop & Go service will run from 2 April 2007 until further notice.

Measure description

A scheme will be established to deliver purchases from a City Centre shopping complex to a suburban Park and Ride terminal. Discussions are taking place with a number of potentially interested retailers in the Norwich city centre, including the developers of the Chapelfield shopping mall which opened in September 2005.

Norfolk County Council, in partnership with Norfolk County Services trialled a new 'Shop & Go' service in December, between Norwich's The Mall shopping centre and the Harford park & ride site. The 'Shop & Go' service allowed weekday users of the Harford park & ride site - both commuters and day shoppers - to ferry their morning shopping back to Harford park & ride at lunchtime, so they could carry on shopping or return to work bag free in the afternoon and did not have to carry it on the bus after work.

Objectives, innovative aspects

The aim of this measure is to provide for timely delivery of goods by clean urban delivery vehicle from a city centre retail complex to a suburban Park&Ride terminal, where the retail goods purchased earlier in the day can be collected by the consumer.

The measure aims to improve effectiveness of a goods delivery service in promoting the use of Park&Ride, thus encouraging use of collective transport, reducing urban congestion and improving air quality. It will reduce the number of car journeys into the centre by shoppers wishing to store and transport purchased goods.

Implementation

Elements included in the measure:

- Identifying a suitable retail site within the area served by the Norwich Park&Ride sites or within a 5 mile radius of Norwich;
- Identifying a suitable Park&Ride site;
- Developing process for deliveries;
- Completing a marketing plan and publicity development;
- Implementation of the scheme.

On 2 April 2007 the Shop & Go service at Harford park and ride was re-launch. This time the service is run by Norfolk County Council in partnership with John Lewis, Norwich and the service is free to use.

The Shop & Go service operates from Monday to Saturday, and follows on from a successful trial during Christmas 2006, where 82 customers used the service during this four week trial, with a £1 fee per customer.

The service is designed to help people enjoy a longer shopping experience, and give an added benefit for Harford Park & Ride users. Customers can do their shopping during the day, dropping off their bags at the John Lewis customer collection point (between 9.30am and 3pm).

Goods are placed in a crate and sealed, then once back at Harford Park & Ride the goods are transferred to a secure locker next to the enquiry office ready for customer collection. The service carries all items

within reason, except for cold or frozen goods, animals, flowers or plants and exceptionally large goods.

John Lewis staff the collection point and also provide the delivery vehicle and driver. CIVITAS funds the publicity for the service and storage at the Harford site.

Usage has been constant but slow with 13 crates being carried up to end July 2007. There has been an increase in usage during August with the summer sales and school holidays.

This measure will be used to determine the effectiveness of a goods delivery service in promoting the use of Park and Ride, thus encouraging use of collective transport, reducing urban congestion and improving air quality.

(Expected) Results

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21-08-2007

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4.30 Priority access for clean goods vehicles (Norwich)

CIVITAS Project

Smile, CIVITAS II

Measure field

Clean vehicles / clean fleet

Status

Ongoing

Measure description

Goods vehicles which meet pre-determined clean vehicle standards will be allowed to use collective transport priority lanes. One demonstration project will be implemented covering an as yet undetermined proportion of the priority lanes in the urban area. This work package is a means to demonstrate the effectiveness of opening up facilities to assist goods operators who respect clean urban transport principles.

The Freight Partnership will limit the actual number of vehicles allowed in the Priority Lanes - but existing bus lanes could accommodate current demand of all freight vehicles 7.5 tonnes and heavier operating on those routes. Smaller vehicles are inefficient in fuel consumption per tonne of freight moved, whether clean or not, and should not be encouraged by priority access over car traffic.

The first task in this Measure is the identification of the key routes used by the "Strategic Freight Stakeholders Partnership"

Objectives, innovative aspects

Allow sharing of priority collective transport priority lanes to freight operators who respect clean urban transport principles.

Increase the proportion of urban goods vehicle transport, which meets pre-determined emission control standards.

Work in partnership with goods operators who respect clean urban transport principles in order to facilitate their journeys in the Norwich area and to mitigate the negative effects of urban freight transport on other network users.

Implementation Status

For the first half of the project this measure proceeded with the aim of determining freight operators interested in participating with them. This involved:

- Setting up web based virtual exhibition
- Adverts of logistics magazines for the web site
- Writing to 700 operators (locally and nationally) asking them to view the site
- A downloadable reply form for operators to express an interest

Now this has been completed and details of interested operators have been obtained the measures within AP10 will be implemented separately - although they are still closely linked.

Study of existing bus lanes in Norwich is complete and a number of issues have been identified regarding their suitability.

As a result an alternative proposal is being implemented would allow use of bus lanes by transshipment centre vehicles only. The original proposal was to allow all goods vehicles to use the bus lane if they meet a certain emission criteria.

The advantages of the alternative proposal would be:

- less vehicles in bus lane;
- easier to enforce as transshipment centre vehicles will be advertised as such on the vehicle's sides;

- promotion of transshipment centre,
- easier to sign on site;
- more control over drivers using bus lane if issues arise regarding conflicts with cyclists.

Main problems with this measure are:

- it could not proceed until location of the transshipment centre is known,
- there could be significant opposition to the measure because of concern about cyclists and HGV's mixing in the same bus lane.

Location of transshipment centre is now known. Political agreement has given to trial the use of the bus lanes on a single corridor into the city centre that is the main route used by transshipment centre vehicles. There has been some opposition to the proposals. Traffic Regulation Orders and physical works associated are being implemented.

This work package is a means to demonstrate the extent to which the shared use of priority lanes can help to meet urban freight objectives.

(Expected) Results

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05-06-2008

Last update:

4.31 Urban transshipment centre (Norwich)

<i>CIVITAS Project</i>	Smile, CIVITAS II
<i>Measure field</i>	Urban distribution centre, Public private co-operation, Clean vehicles / clean fleet
<i>Status</i>	Ongoing
<i>Measure description</i>	<p>An urban transshipment centre for freight deliveries and collections within the city centre will be established, reducing congestion, emissions and noise, and improve urban air quality by optimising urban goods delivery journeys with clean and energy efficient vehicles.</p> <p>One urban transshipment centre to facilitate the use of clean and energy efficient goods vehicles in the urban area will be established. This element of the work package will be used to demonstrate the suitability of an urban transshipment centre in contributing towards meeting clean urban transport objectives.</p> <p>The transshipment centre will have to have significant storage warehousing available with good fast and direct transport links to the central core of the City; as well as the national trunk and primary road network and the rail network to provide modal choice for transport outside the central core of the City.</p>
<i>Objectives, innovative aspects</i>	<p>The objective is to develop an urban transshipment centre for freight deliveries and collections within the city centre, either by building upon a private transshipment centre already in place, or by creating a new publicly controlled and operated facility within the context of a Freight Quality Partnership.</p> <p>The transshipment centre should reduce congestion, emissions and noise, and improve urban air quality by optimising urban goods delivery journeys with clean and energy efficient vehicles.</p>
<i>Implementation</i>	<p>Months 1-18: Work with companies operating existing transshipment centres to more fully understand their current operational methods and identify a demonstration site.</p> <p>Months 18-24: Continue to work with logistics companies to establish a demonstration site</p> <p>Months 18-36: Initiate and implement statutory procedures to facilitate function of transshipment centre.</p> <p>Month 36: Implement demonstration site</p>
<i>(Expected) Results</i>	This work package is a means to demonstrate the extent to which the establishment of an urban transshipment can help to meet urban freight objectives.
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<i>Last update:</i>	01-05-2008

4.32 Freight partnership, planning, routeing, signing (Ploiesti)

Success, CIVITAS II

CIVITAS Project

Public private co-operation
Fleet management & route planning

Measure field

Ongoing

Status

In Ploiesti the reasons for designing the City Logistics Strategic Scheme are:

Short measure description

- No policy regarding freight transport;
- Big pollution and congestion because of un-rationalised freight transport;
- No investments for logistic facilities;
- No efforts to put together the actors.

In this context, the next following steps will be:

- Tender procedure for elaborating the City Logistics Strategic Plan (conditions of contract and services delivery contract for the strategic scheme design);
- Elaboration of a City Logistics Strategic Plan (Rules and measures for organizing the traffic);
- Feasibility Study elaboration (it results technical solutions: Defining of freight routes and Defining Freight signing and financial assessment);
- Consulting the transporters and the businessmen in order to establish the technical solution;
- Promotion activities.

City Logistics Strategic Plan is the first step in order to restrict the heavy transport and setting up the alternative routes for delivery the goods.

- Creating some discharging crossing stations (North and West terminals);
- Reducing the traffic congestion inside the city;
- Optimizing the transport network;
- All transport modes correlation;
- The co-operative approach of stakeholders;
- The public-private partnership.

Objectives, innovative aspects

Measure implementation requires the following actions:

Implementation

- Elaboration of City Logistics Strategic Plan;
- Design of a Northbound area dedicated to distribution of merchandises for population;
- Design of a Westbound area, dedicated to services for B2B;
- Freight routes defined;
- Freight signing defined;
- Establish a Freight Forum.

(Expected) Results

- Freight routes defined and signed;
- Increased efficiency of goods distribution;
- Reduce the traffic congestion;
- Reduce pollution and noise due to the introduction of clean vehicles.

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24-11-2006

4.33 Widening the Environmental Zone for Vehicles over 6 tons (Prague)

Trendsetter

CIVITAS Project

Access management

Measure field

Implemented

Status

The measure tries to limit the heavy haulage vehicles transiting selected densely populated areas of the city centre. A large expansion of the existing zone in Prague was implemented. The regulations are based on weight and to get access to the zone the road operators need to apply for a permit. The regulations in Prague are thus dependent on weight and on the legitimacy and importance of the transport (goods delivery, building works etc.). This successful measure has resulted in less heavy traffic, and thus less pollution and road wear and tear. The obedience level in the new part of the zone is roughly 50 %.

Measure description

The purpose of the measure is to limit the heavy haulage vehicles transiting selected densely populated areas of the city centre. This way, the negative impact of heavy haulage vehicles on the flow of traffic is reduced, including collateral effects (emissions, noise). Moreover, there also be an effort to increase acceptance of clean vehicles and create a more attractive city centre.

Objectives, innovative aspects

Implementation of new borders of the environmental zones in accordance with changes in traffic flow and heavy vehicle traffic after construction of the city Outer Ring road is in progress.

Implementation

The following steps were instrumental in implementing the measure:

- an urban traffic condition analysis;
- candidate areas selected to widen the Environmental Zone;
- traffic surveys were conducted;
- the results analysed;
- extension zones proposed;
- the propositions discussed with authorities and general public;
- traffic marking changes were designed;
- the changes were approved and administrative decision issued;
- the Extended Environmental Zone was launched.

During the measure's implementation the following activities have been carried out:

- traffic administration measures regulating the urban mobility of selected vehicle types;
- traffic marking delimiting specific zones;
- enforcement provided by police random checks.

The environmental zone has been widened as planned and emissions, noise and energy consumption have been reduced and the attractiveness of the city centre has increased. Restricted zones support automobile park conversion towards new technically advanced vehicles with less fuel consumption and decreased emissions. There has been a shift in fleet towards more environmentally friendly vehicles.

Results

The measure has achieved:

- reduction of emissions;
- reduction of energy consumption;
- a shift in fleet toward less energy-demanding and cleaner in emissions and noise, more modern Euro x vehicles;
- an increased city centre attractiveness.

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Last update:

24-11-2006

4.34 Freight Partnership (Preston)

Success, CIVITAS II

CIVITAS Project

distribution scheme

Measure field

Ongoing

Status

The main action will be to develop the strategic planning for city logistics, based on the experience of La Rochelle. This will also lead to the definition and mapping of freight zones

The Measure

This will be accompanied by the establishment of a Freight Forum for Preston and South Ribble, to share best practice and the elaboration of Freight Quality Partnership for central Preston.

The objectives of this measure will be to develop and implement a strategic plan for city logistics, based on the experience of La Rochelle and other best practice

Objectives, innovative aspects

- Establishment of a strategic plan for city logistics in Preston;
- Establishment of Freight Forum Establishment of Freight Quality Partnership – COMPLETE;
- Freight zones defined and mapped. This section will fall out of the recommendations of the TTR report produced January 2007;
- Freight Strategy has been written and is to be accompanied by a Preston specific annex;
- a similar annex will be developed for South Ribble in due course;
- Improvement to freight signage is due for completion Spring 2008;
- Work on the freight map is ongoing, and when complete the map will be distributed as paper copies but will also be posted on the new transport portal;
- The aim is for a freight specific page, which will hold an up to date version of the freight map along with providing access to the freight strategy;
- There will also be a freight forum facility on the website to allow people to comment on the map and the freight strategy and to allow discussion of freight issues with a wider audience than the current membership of the Preston FQP;
- Signage work is being updated to allow direct delivery of new/rationalised signage on freight routes in Preston. It is hoped that this work will be completed before the next FQP in March 2008.

Implementation

- The FQP is forging strong links between freight users and policy implementers within local government.
- Strong links with outcome from the Preston Clear Zone and access control. By the time this is written up.
- Agreeing freight zones and routing with members of the FQP and preparing draft zonal map.
- Publication of freight map.
- Production of the freight strategy for Preston and South Ribble, which will incorporate a strategic plan for city logistics and the other measures to be implemented through CIVITAS.

(Expected) Results

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23-04-2008

4.35 *Electric Vehicles for the distribution of goods (Rotterdam)*

Tellus

CIVITAS Project

Clean vehicles

Measure field

Implemented

Status

Before TELLUS, the small-scale demonstration in the local site ELCIDIS project in Rotterdam could only be performed till August 2002. The foreseen extension of the demonstration period enables a better understanding of using this new technology. A successful use of this technology will create more understanding for policy measures like "access restrictions" and for the use of clean vehicle technologies in common, also at private companies. Three transport companies are responsible for the distribution of 70% of all parcels & packages in Rotterdam. Small trucks and vans are used for the distribution of goods in and out of the city. Seven electric vehicles for urban distribution were introduced for deliveries of parcels & packages. The vehicles had to prove themselves in the existing logistic systems of the three participating companies. A vehicle serves up to a hundred addresses a day in one single trip, which demands a payload of 1000 - 1500 kg. This type of electric vehicles has not yet been widely tested in practice, which means that TELLUS offers a unique opportunity for doing so.

Measure description

Demonstrate the viability of using clean, quiet and energy efficient vehicles for urban distribution and stimulate further spin-off in commercial fleets.

Objectives, innovative aspects

It was decided that the only suitable vehicle to fulfil the needs was the Mercedes-Benz 308 E Sprint, with ZEBRA batteries. The range of the vehicles is 50 km with two battery packs and 75 km with three battery packs. In the previous project period only 2 out of 7 vehicles have still been operated and that is no sound base for a more extended implementation of such vehicles. Despite all efforts of DaimlerChrysler to prevent breakdowns the technical reliability remained a continuous problem. During the test period there were technical failures of the electric system, controlling the battery management.

Implementation

DHL was nevertheless willing to continue the test, as a result of the agreements made with DaimlerChrysler regarding replacement of broken down vehicles.

Based on the experiences with the seven vehicles an introduction plan for clean vehicle procurement in private distribution fleets was foreseen to be realised around February 2005. Due to the severe technical problems, but also due to newly retrieved information from involved parties and external developments, an altered approach will be followed for the final reporting of this work package and for the planned introduction plan to support the deployment of clean vehicles in the fleets of distribution companies.

Results

Barriers and drivers

Obviously the technical problems occurring with the vehicles are an important barrier for the introduction of electric vehicles for distribution purposes. Even the 2 out of 7 vehicles that were still in operation with DHL at the start of the project are not in function anymore. There is no sound base for a more extended implementation of such vehicles, especially since the investment costs are considerably higher than for conventional vehicles.

The need for beneficial measures to support users of clean vehicle technologies has been made part of the new Environmental Plan (approved October 2002). Within the city of Rotterdam however no agreement on access time windows was reached so beneficial measures have not been implemented.

An important driver remained the satisfaction of both distribution managers and drivers of the vans. When not hampered by technical breakdown, the vans performed satisfactory regarding to the transport performance (acceleration), comfort and positive attitude of the public.

Lessons learned

This measure encountered severe problems during its operation. Critical malfunctioning of the battery management system led to a considerable number of breakdowns. None of the 7 vehicles are still in operation and that is no sound base for a more extended implementation of electric vehicles. A probable cause of the problems could be a bad installation of the battery system but both the supplier of the battery system as the supplier of the vehicles did not agree on this issue. Therefore the positive results in several other projects with electric vehicles could not be sustained here.

When the technical problems are overcome there would be no clear obstacle for the introduction of electric vehicles for city distribution. The attitude amongst distribution companies, both managers and drivers, is basically positive. The initial costs are high but could be compensated by lower variable costs. The introduction of complementary measures such as access time windows for clean vehicles would be an useful incentive but probably not decisive for the final decision.

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4.36 MultiCore Tube Logistics (Rotterdam)

Tellus

CIVITAS Project

Distribution scheme

Measure field

Implemented

Status

The introduction of a system of underground tube transport of chemicals in the industrial zone in the port area can contribute to a reduction of transport by road over a distance of 25 km and more efficient use of underground space in the port's industrial zone.

Measure description

Operate an alternative for truck movements by road, leading to less road congestion and less air pollution. MultiCore Tube logistics is a new organisational concept for underground pipeline transport in the port area for various smaller quantities of oil, chemicals and gas. This environmental friendly, safe and undisturbed mode of transport is open for all interested industries in the area, transporting different kind of chemicals.

Objectives, innovative aspects

Companies can obtain transport capacity by leasing a pipeline of MultiCore over a required distance. MultiCore connects sites of companies to its pipeline; companies take care of the transportation of their goods. MultiCore takes care of permits for use of its pipelines. Calculations on a variety of pipeline configurations, in terms of investment against expected rental income, showed four tubes to yield the best results. Laying the four tubes closely together, in two layers further brought down investment needs. Calculations and tests have shown that the minimum distance between the MultiCore tubes could be 0.25 m rather than the usual 0.6 m and that this still accommodates branching to customers at any given point.

Implementation Status

A lot of customers showed interest in the MultiCore system. The contract with the 4th customer will be signed very soon. The system is getting better known publicly. We are continuing our efforts of convincing more companies of the advantages of this system of underground tube transport.

Results

The infrastructure of the pipeline has been developed in two stages: from Europoort to Botlek and from Botlek to Pernis. At the moment MultiCore has four contracting parties, occupying fifty percent of the pipelines:

Exxon Mobil uses 14 km pipeline bundle (Europoort – Botlek) for the transport of Oxoalcohols (since January 2003).

- Air Products uses two tubes in a 6 km pipeline bundle (Botlek – Pernis) for the transport of O₂ and N₂ (since October 2003).
- MultiCore obtained the 3HoekLoos leases 14 km of 8 inch pipeline to transport CO₂ (average 135.000 ton a year) to greenhouses (since October 2005).
- Shin Etsu uses the pipelines for transporting Vinyl Chloride Monomer (VCM) (since August 2005).

There were no obvious legal or policy barriers. Prerequisites for success mainly are the involvement of private companies willing to share the financial risk with the Port of Rotterdam. In this case Vopak agreed to

Barriers and drivers

participate and take care of maintenance and management. Furthermore on forehand two large companies supported the project ('launching customers'). so that an start could be made. The contacts with some public bodies in the region have also led to a better acceptance of underground pipeline transport in general. They also form a sound basis for further cooperation in the future.

Lessons learned

This measure was both successful in the process as in the impact. The milestones were delivered according to plan without deviations. There appear to be no major obstacles for implementation, although probably many of the more troublesome preparation stages have been conducted prior to the TELLUS period.

The impact for most indicators is either neutral or positive. Especially the improved energy efficiency contributes to positive impacts but there is also a modal shift. Since the modal shift for road transport is rather limited, a significant contribution to decreased congestion problems cannot be expected. The investment costs are rather high and the break-even point for the operational revenues is not reached in a short period of time.

Because of the success of the measure, an uptake potential in other industrial areas is present but careful considerations are necessary to determine whether the market conditions are suited for a tube system. Suited market conditions amongst other are the availability of companies involved in chemicals (and energy).

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Last update:

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4.37 Quality network for sustainable freight transport (Rotterdam)

Tellus

CIVITAS Project

Access management/ Enforcement

Measure field

Implemented

Status

The measure intends to create a network for regional freight traffic, which takes into account the needs of the transport companies in the region.

Short measure description

In 2000 a stakeholder meeting with transport companies reached the conclusion that limitations for freight traffic - such as access time windows- in the region of Rotterdam were not compatible with the needs of the companies and would not deliver the expected results. The results of some measures would even be more instead of less freight traffic. The regional authority gave the instruction to analyse the situation and to make the measures more compatible with the needs of the companies. They decided also to design an integral regional policy for sustainable freight traffic.

Design and implementation of a regional policy for sustainable freight traffic in the region Rotterdam, which increases efficiencies and limits externalities.

Objectives / Innovative Aspects

First a study for urban distribution in the city centre of Rotterdam was carried out on request of the key stakeholders. The results of this study and the discussion of the results with the key stakeholders have lead to the plan to design the so-called "Quality Network". The Quality Network should be regarded as a fundamental condition for efficient sustainable regional distribution. A regional sustainable network contains requirements on safety, accessibility, economical vitality and liveability (noise, air pollution and nuisance). The challenge is to find a good balance between these requirements. In the light of liveability part of the policy is on how to encourage transport with clean commercial vehicles. The quality network is defined but more research is necessary to determine the quality indicators and to get information on the required alterations of the network and the organisation of freight transport in the region.

Implementation Status

In dialogue with the key stakeholders the Quality Network will be designed. The network has a physical and a non physical policy aspect. Rotterdam starts with the physical conditions as the type of road, absence of obstacles etc. By the end of 2003 the key stakeholders appointed the most important economical destinations and routes in the region.

Results

These destinations and routes are the basis for the Quality Network. The non physical requirements and limitations should be compatible with the needs of the companies and effective in the region. Non physical requirements are social or juridical conditions such as access time windows and promotion for clean commercial vehicles.

Barriers and drivers

The accessibility for city distribution vehicles was not a major problem within Rotterdam. This appeared to be a barrier for the introduction of time windows, as well as the poor availability of clean vehicles. Also the need for an integrated regional approach hampered the introduction of time windows in the city of Rotterdam.

Lessons learned

This measure was one of the few TELLUS measures that were not able to meet its original or adapted milestones. The main reasons for this were studies which showed accessibility for city distribution vehicles was not a major problem within Rotterdam as well as the poor availability of clean vehicles from 12.2. Also the need for an integrated regional approach hampered the introduction of time windows in the city of Rotterdam.

The project however did bring together some relevant stakeholders for goods transport in the region and paved the way to put the issue of goods transport in relation to environmental thresholds on the agenda. This is all the more relevant since the environmental burden by traffic and transport in general and goods transport in particular is likely to be a major issue for the coming years. Already the development of projects for spatial planning is affected by traffic related burden caused by noise and dust emissions.

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27-07-2007

4.38 Truck Parking Management (Rotterdam)

Tellus

CIVITAS Project

Parking Management

Measure field

Implemented

Status

In order to prevent noise reduction and to optimise accessibility and safety in urban areas close to the port district, an area has been designated with 60 long-term parking places for truck combinations.

Measure description

The residents of urban areas close to the port district suffer noise pollution because of trucks parking in residential streets. In addition the district is not optimally accessible and the residents do not feel safe. To try to solve these problems, an area has been designated with long-term parking places for truck combinations (Truck Park). The project incorporates two innovative aspects. The first is that the expansion of these parking spaces is seen as a solution for noise pollution in residential areas. The second aspect is the intelligent use of limited space.

Expansion of the Truck Parking management concept, to prevent long term parking of truck-combinations in residential quarters close to the port area.

Objectives, innovative aspects

The Truck Park Fruitport is located in a port area with fruit companies and is close to the residential areas of the Delfshaven district. The Truck park offers secured parking with 24 hour surveillance for trucks and other lighter distribution vehicles.

Implementation Status

The Truck park is already in use with 60 parking spaces for long term parking (up to a maximum of one week). In 2004 around 10.000 trucks parked at the facility. The trucks using the facility are both national and international. Almost all trucks had one of the Fruitport companies as their destination.

(Results

The main barrier for this measure was the acceptance by truck drivers to use to the Truckpark. It is essential to communicate with them and explain the benefits of the Truckpark in terms of safety, convenience and efficiency. Here the use of the Truckpark was stimulated and enforced by the companies that actually handle the cargo. There were no major other barriers from political/administrative, societal, economical, technical, or other factors.

Barriers and drivers

This measure has some recognizable success and failure factors. An evident success factor was the clear separation of tasks between the stakeholders. The Port of Rotterdam was only responsible for design and implementation. The Fruitport Foundation is responsible for maintenance and management of the truck parking area. This agreement both enhanced the positive attitude of Port of Rotterdam as did it enhance the acceptance and support of the companies in the Fruitport area.

Lessons learned

The acceptance for the project in the residential areas was ensured from the start but positively influenced by the activities of the local authorities in parking control and therewith stimulate truck drivers to avoid the residential area.

A factor that clearly can disturb the project is insufficient communication with and encouragement of the truck drivers. An appropriate signing of the route to the truck parking area is necessary. Also the fees for the truck parking area should not be too high in order to avoid unwanted effects such as transfer of the initial problems to other areas.

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15-08-2006

4.39 Cleaner Vehicles for Waste Collection and Road Sweeping (Rotterdam)

Tellus

CIVITAS Project

Clean vehicles

Measure field

Implemented

Status

In the present situation, no waste collection and sweeping machines with particulate filters are in use, due to the fact that until very recently these filters were not available at all. In the Rotterdam city area the coming year over 3,000 extra underground containers for waste collection will be realised, bringing the total to 4,600. New waste collection vehicles had to be introduced for emptying those containers, replacing the weekly waste collection with plastic bags.

Measure description

Introduction and "real-life" testing of a new developed active filter system for 2 new waste collection trucks and determine if for PM10 a EURO V level is feasible for this type of truck use. For another type of filter system (E-CRT), suitable for retrofitting, the same approach will be followed for 1 existing and 1 new waste collection truck. A successful test of the retrofit filters will result in a large scale implementation of that system for around 30 existing vehicles.

Objectives, innovative aspects

Originally 20 new waste collection vehicles would be equipped with special filters working at very low exhaust temperatures, typical for waste collection trucks. However, DAF trucks found out that the original system would not work, due to the fact that the proposed electric heating system would require a huge battery pack, thus also needing a strengthened chassis. Technically this system was completely unacceptable. Consequently another filter system had to be developed. In fact, for this typical vehicle use in urban areas the application of an active regeneration system of particulate filters is inevitable. European truck manufacturers are now all focussing on the optimisation of diesel engines for heavy duty vehicles by means of active filter systems.

Implementation Status

A positive result will exert favourable influence on future decisions in ordering more waste trucks with such a system, not only in Rotterdam, but at least nation-wide in the Netherlands. Next to the waste collection trucks another interesting development is a special filter system for smaller diesel vehicles that is introduced on 20 existing sweeping machines.

(Results)

The results of the CPO systems clearly showed a positive result on the reduction of particle emissions, although the official measurements by TNO were somewhat disappointing. The systems also proved to be robust and reliable and did not lead to an increase of maintenance costs. Also the fuel use did not show any negative side effects. The systems are suited for retrofit and although there are still significant investment costs, the purchase costs of €3,000 per filter systems are not necessarily a major obstacle. However, with the aim of firmly reducing particle emissions, the search for more effective systems remains important.

The active filters encountered serious technical problems probably caused by the extra features required to operate such a filter in waste trucks. Other active filters, like the SCR systems installed in buses did not encounter these problems. Logically due to the technical malfunctioning

no positive impacts were gained. It is obvious that in the future the E-CRT systems have a higher potential for this kind of application.

Barriers and drivers

Like other technical measures the technical barrier was the most imminent factor for the success of the implementation. After the identification of a new and feasible technical solution, there were no major obstacles anymore of either political/administrative, societal or economical nature.

Lessons learned

The most relevant recommendation, next to availability of feasible technical innovations, is to create conditions for cooperation between manufacturers and suppliers on the one hand and users of the equipment on the other hand. Surely here the cooperation between the truck manufactures and filter supplier and the demands of the waste collection company proved to be vital for a satisfactory outcome of the measure, even when the initial objectives could not be met due to technical problems.

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November 2006

4.40 Clean and efficient heavy vehicles (Stockholm)

Trendsetter

CIVITAS Project

Clean vehicles

Measure field

Implemented

Status

Optimise the use of biogas locally by fuelling heavy vehicles that are used in sensitive and densely populated areas in the city centre.

Measure description

The overall purpose of this measure is to demonstrate that it is possible that in a cost effective way substitute conventional heavy diesel buses and trucks with clean heavy vehicles running on renewable fuels.

Objectives, innovative aspects

The project consists of the following tasks:

- Purchase of 26 heavy biogas vehicles (distribution trucks and/or buses);
- Demonstrate heavy vehicles powered by biogas in normal operation in Stockholm's transport system;
- Monitoring and evaluation of biogas heavy vehicles (compared to diesel vehicles);
- Survey among the drivers of the vehicles.

The local transport company, SL, operates about 1.700 buses through their entrepreneurs who own the vehicles. 250 of these operate in the city centre and are running on ethanol. In 2002 the board of SL decided to replace 125 of the ethanol buses in the central city area with biogas buses. The replaced ethanol buses were moved to areas outside the centre where they replaced 125 diesel buses. The procurement has been completed and the first 21 buses have been delivered 2004. Ten of these are of the brand MAN and 11 are VOLVO buses. After assessment of these 21 buses decision will be taken which brand to chose for the rest of bio gas buses. All 125 buses are to be delivered by the end of 2008. To secure the supply of bio gas SL has signed a long-term contract with the supplier Stockholm Water Company that guarantees supply of gas for the buses for 20 years. The gas is distributed to the bus garage in a pipeline from the production plant at Henriksdal. A local storage and a filling station have been built on the garage premises. This filling station is not open to the public.

Implementation Status

All stakeholders are satisfied with the new buses. They are functioning as expected and the economy is according to plan. The noise level has been decreased by 50%. No harmful emissions of carbon dioxide, much less emissions of harmful nitrogen oxides and particles.

Recently SL has taken another step to substitute more diesel buses. They have decided to so by buying 100 new ethanol buses within the next few years.

The board of the Stockholm Water Company has decided in 2002 that all the diesel lorries (10-15 per day) used in the work to invest, reinvest and maintenance shall successively be substituted by bio gas lorries. The substitution should be completed within the next five years. So far two diesel lorries have been substituted. Most of the transport services are bought from private transport companies. To stimulate the transport companies to offer clean vehicles Stockholm Water Company offers a better price to those who do so. All the stakeholders are so far very satisfied with the bio gas lorries. They are functioning as expected and the economy is according to plan. The noise level has decreased by

50%. No harmful emissions of carbon dioxide, much less emissions of harmful nitrogen oxides and particles.

(Expected) Results

The consumption of fossil energy has been reduced by 20.984.412 MJ per year. The emission of fossil CO₂ has been reduced by 86 %, equals 1.329 tons per year. Emissions of NO_x, particles and CO have been reduced by 50%. However the emissions of HC have increased by 20 times.

The cost of maintenance has increased from 0,033 Euro per km to 0,045 Euro per km. The increase in cost depends on the fact that the biogas engine is an Otto engine, which needs more service and change of spare parts than a diesel engine. The fuel consumption has gone up with 60% in comparison with the consumption of corresponding diesel vehicles. This is due to the fact that the diesel engine is more energy effective than the Otto engine especially when running at low load. The consumption of motor oil has been twice as high in the biogas vehicles compared to diesel vehicles.

The driver acceptance has been monitored and evaluated. More than 90% of them were satisfied or very satisfied with their experience from driving heavy bio gas vehicles and a majority said they would recommend others to drive bio gas heavy vehicles.

The local public transport company, SL, has decided to procure 100 biogas buses to the year 2008. The company has also decided to buy 100 ethanol buses during the same time. In total SL operates more than 1.700 buses and the companies' ultimate goal is that all buses should be clean. A common co-ordinated procurement of ethanol buses is planned in order to get prices down. Several actors around the world are likely to take part in this procurement process.

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4.41 Logistic centre for Old Town (Stockholm)

Trendsetter

CIVITAS Project

Urban distribution centre
Clean vehicles / clean fleet

Measure field

Implemented

Status

The project will continue after the Trendsetter period is over.

Small and very narrow streets in the Old Medieval Town of Stockholm make distribution traffic chaotic and cause environmental problems. A logistic centre was set up nearby the Old Town, where restaurant supplies are reloaded and co-transported with small biogas-fuelled vehicles. As a result, the average number of deliveries to each restaurant is down from six to only one delivery per day. There is a big potential to reduce the total number of vehicle kilometres further if more restaurants join the project.

Measure description

The main objective was to decrease the number of small direct deliveries to restaurants and shops in the Old Town through co-transportation with clean vehicles. This would result in an improved environment for inhabitants, visitors and people working in the area.

Objectives, innovative aspects

- Decrease the number of small direct deliveries to restaurants and shops in the Old Town through co-transportation with clean vehicles
- Less traffic jam during delivery hours in the Old Town
- Improved environment for inhabitants, visitors and people working in the area
- Reduce energy use and emissions. Estimated energy and emissions savings corresponding to 30'000 km of driving diesel lorries.

There has not been any consolidation of restaurant supplies in this area before, and establishing a Logistics Centre for this reason is an innovative aspect. Other innovative aspects include trying to find methods of consolidating other types of goods, for example returned goods. In the pilot project a new technology for refrigeration in delivery vehicle has been used, which was developed by KTH (Royal Institute of Technology, Stockholm).

The project was implemented in January 2004. A marketing campaign and the inauguration of the reconstructed terminal and biogas vehicle were held in June 2004. The operation of the terminal began in January 2005.

Implementation

The expected outcome from the LC is to increase the number of customers from 14 to 25. By introducing the LC for food deliveries, the transport mileage to those restaurants is expected to decrease by 65%.

Results

The calculations for the LC are based on invoice data from the "O-centralen". The number of stops and cages are calculated for the period from December 2004 until February 2005. The numbers are then multiplied by 4 to get the yearly result. This is due to the short period of time the LC has been in operation. The results show that the outcome of a LC for the Old Town in Stockholm is good. There is a huge potential to reduce the total number of vehicle kilometres, if the LC succeeds in the process of gaining more customers. The living environment in Old Town will be improved if the numbers of vehicle kilometres decrease even

more. With the LC, the total number of trips is reduced by 9 trips per day and the number of vehicle kilometres is reduced by 6 km per day.

Barriers and drivers

The biggest barriers of the project have been:

- The lack of customer demand and involvement;
- The lack of overarching knowledge and interest from the different bodies of the town and their lack of flexibility when it comes to testing new technologies and logistics.

The biggest driver of the project has been the interest of other groups to the project. Locals, politicians and officials, but also NGOs and the media are convinced that the "LC model" is a model for the future. But, it is also important that the company, H2U, has a genuine interest in consolidation of goods and environmental issues. This is the reason that the project will continue after the Trendsetter project ends. A strong and convinced leading spokesman is needed for a project of this nature.

The Old Town in Stockholm is a typical medieval city centre as can be found in many European cities. If a working system is developed it has a good possibility for implementation in many similar cities in Europe. This could be a driver for other similar projects. There is a need for special solutions for this kind of areas. The main barrier for vehicles is the narrow streets. But to find a solution with a small biogas-fuelled vehicle as in Stockholm is a good solution to the problem and becomes an additional driver for continuing with the project and makes it easier for other cities to motivate.

Restaurant supplies are a common problem when considering consolidation of goods. There are a lot of barriers when talking about permits and exemptions. A good example of consolidation of food products can lead to other implementations of similar projects.

Financing aspects

The investment costs have been very high. For a bigger company there would be no problem to buy another truck, but that means one or two more employees and the problem to engage the two trucks after 11 a.m. To expand they would need more customers and today it is difficult to contact new customers. Another vehicle will be purchased when the project has gained more customers.

There have been no subsidies from the City of Stockholm and the project is supposed to be self-financing. But, H2U has a general interest in being a part of tomorrow's logistics and market. There is also an interest in transforming H2U into a sustainable company. This project has given H2U some positive economical effects goodwill, new customers and perhaps some good marketing. The City of Stockholm has redistributed a contribution for the project from Trendsetter, but those investments have mostly covered meetings and writing reports.

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4.42 Material logistic centre - To optimise freight deliveries at construction site (Stockholm)

Trendsetter

CIVITAS Project

Loading Zone

Measure field

Implemented

Status

Hammarby Sjöstad is one of the largest constructions sites in Stockholm with a target of 8000 apartments. The site is under construction in a former harbour area in Stockholm and will be finished in the year 2015. The access possibilities for deliveries are restricted, due to both geographical reasons and existing buildings.

Measure description

A Logistic Centre (LC) was introduced at the entrance of the construction site and received all small deliveries (less than four pallets) and stored the construction materials temporarily. Deliveries were then made with special vehicles to the different construction locations in accordance with the construction time plans.

The Logistic Centre aims to reduce the number of transports into the area through co-transportation in order to achieve less congestion and more human living conditions.

Objectives, innovative aspects

- Decrease the number of small direct deliveries (under 4 loading pallets) to the site with 80% through co-transportation
- Less traffic jam in the construction site
- Improved living conditions at site for new inhabitants
- Improved working environment
- Reduce energy use and emissions

The centre was set up and operated over a three year period. The LC went into operation in 2001 and had its peak in 2002. During 2003 and 2004 the intensity of the construction work has been lower and the LC has now been dismantled and moved into a building nearby to make room for new buildings.

Implementation

The LC was situated in the heart of Hammarby Sjöstad. Inside over 3500 m² was available protected by alarm-systems. Outside 4000 m² was available and about 10 people were working in the LC. The delivery-float included 3 trucks with crane, 1 large truck with long crane, 3 forklifts and 1 pick-up.

The LC offers three different services:

- Co-transportation of goods
- Temporary material storage
- Smart traffic guidance system

1) Co-transportation: Deliveries below four pallets from different suppliers reach LC. The goods being unloaded by forklifts and registered in the computer system. The goods are moved to a special coloured area depending on which object are the receiver. Two times a day trucks made the final delivery out to the site together with other material from other suppliers.

2) Temporary material storage: Each contractor got an own area in the LC where he could store material. To be sure that the material didn't would be left to long in the LC, the contractors get charged by the LC after 4 days. If the contractors would like to their material for longer periods, they paid the same rate as the fifth day. The space was divided into spots and dedicated to the contractors depend on the construction- volume. The trucks of LC always distributed materials that were stored in the LC.

3) Smart traffic guidance system: To prevent traffic jam on the site, for those deliveries which not passing LC, an internet based calendar was created. Each contractor that was dependent in the same road had access to the same part in the calendar where they visualise incoming trucks. In that way it is possible to overview the total amount of incoming trucks and prevent traffic jam. In the LC a traffic coordinator was hired to follow up all registrations and when the roads got stacked he could through his computer send SMS to variable signs and mobile phones. The aim with this service was to avoid serious traffic jam inside the area.

Results

The Logistics centre in Hammarby Sjöstad was successfully implemented. Measure objectives have been mostly fulfilled. Decreasing the number of small direct deliveries with 80 % has been fulfilled during peak conditions. The LC has been a well working integrated part of the supply chain. There has been considerable savings of energy and emissions during peak conditions. The users are very satisfied. There has also been considerable reduction in thefts, losses and damaged materials.

Both living and working environment is calculated to have been much better with the LC, than what it had been without it (only calculation since there is no comparison with a situation without the LC). The LC helped reduce the number of vehicles and traffic jam. That is the main reason for the good results.

The LC will continue in the next phase of the construction. Different financing this time around. However it is the building companies themselves that are now asking for this service in the next building phase.

During this in-between phase the LC is kept on a low function level until the next phase begins.

Barriers and drivers

This project would never have been raised without the efforts of the City of Stockholm. A major economic risk was taken by the city. To succeed a project like this, a strong coordinator is needed to gather the different contractors and set targets together. One of the reasons why this kind of solution is not more common, is that the (building) industry is conservative.

There is no legal barrier in this project since there are no hindering regulations. But, one huge barrier for understanding of the problem of the increasing number of heavy vehicles in distribution traffic is the transport costs. The actual cost for transportation is rarely mentioned in invoices, but is included in the price of the merchandise or product. This can lead to a discontented situation where the customer thinks that the transport is for free. There needs to be more focus on hidden costs.

A higher understanding of logistics and environmental issues would be a good step towards decreasing the barriers for LC projects. The concept that the LC provides is applicable in almost all other construction projects. With the right size (number of deliveries) and with the right geographical and traffic prerequisites there is economy in such a project. The need for economic support is mainly to overcome the

conservative attitude and culture within the construction business and get the project started.

One driver in motivating this kind of project and obtain funding is to highlight the opportunity for ending the construction project on time and within the budget.

Initially, the system was sponsored by The City of Stockholm. At first, the sponsoring consisted of 95% of the LC budget. After a while, when different services became more familiar to the clients (contractors) and they understood that they could save money using the LC's different services it was possible to increase the prices, and by the end of the project it was almost at breakeven for cost/income. The city contribution was then about 40% of the budget. In a continuation of the project, the city contribution is estimated to be 0%.

Financing aspects

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Contact

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Last update:

4.43 Waste collection with biogas-vehicles (Stockholm)

CIVITAS Project

Trendsetter

Measure field

Clean vehicles

Status

Implemented

Measure description

Within this project, 8 biogas refuse collection vehicles will replace vehicles currently driven by diesel. Biogas vehicles produce less emissions and noise. The reduction of noise is important since refuse collection vehicles run in residential areas early in the mornings. Since the City now has a lean organisation, the new vehicles have to be purchased and run by entrepreneurs. Experiences from the Zeus-project, purchasing and running of the existing biogas vehicles, will be used in order to help the entrepreneurs. The participating entrepreneurs, who will own and operate the biogas freighters, will be members of the network Clean Drivers of Stockholm.

The measure aimed to introduce clean waste collection vehicles to the entrepreneurs that are running the waste collection in Stockholm on the account of the city's Waste Management Administration. In order to collect the waste from the inhabitants the City of Stockholm Waste Management Administration runs 85 waste collection lorries through their entrepreneurs. The number of vehicles in the Stockholm region is large and issues concerning noise and pollutant emissions need to be dealt with.

This part of the Trendsetter project required the city contractors to operate one or two biogas-fuelled waste collection lorries each. The city already before the start of the Trendsetter project had access to two biogas fuelled waste collection lorries through the EU-supported project of Zeus (Zero and low Emission vehicles in Urban Society). Those biogas vehicles have been greatly appreciated both by drivers and by residents since they are so much quieter than their conventional counterparts. Based on that positive experience the City of Stockholm decided to replace another eight to ten diesel waste collection lorries with biogas vehicles.

The contractors own and operate all waste collection lorries on the city's Waste Management Administration's account. The Administration demands a limited number of biogas vehicles when tendering for new entrepreneurs. In order to support the contractors to invest in clean vehicles they were offered Trendsetter co-financing for a part of the extra costs involved in investing in biogas collecting lorries, up to a total of eight to ten vehicles in the project. The entrepreneurs working for the Waste Management Administration should then use those vehicles in the daily operation. After the introduction of the biogas collection vehicles an evaluation would be carried out. The evaluation should include operational users as well as the citizens' attitudes regarding biogas fuelled waste collection lorries.

- Procurement of new entrepreneurs, which will operate the waste collection in Stockholm.
- Launch of new lorries in operation in certain inner city areas and operation.
- Evaluate operational use as well as citizens' attitudes regarding biogas fuelled waste collection lorries.

Implementation

For the time being eight biogas fuelled waste collection lorries has been purchased within the framework of Trendsetter. This makes the total number of ten biogas-fuelled waste collection lorries in operation in the City of Stockholm, corresponding to almost 12 percent of the total fleet. The biogas lorries are five Scania P114, and one Mercedes 2628 Econic.

Results

All in all, the drivers are satisfied in operating the new lorries. They also express good feelings about the clean vehicles initiative. The clean waste collection lorries have been running approximately 11 000 kilometres each during one year during the period 2003-2004. The fuel consumption was approximately 1 cubic metre per kilometre. This figure can be compared to diesel waste collection lorries that consumes approximately 0.75 litres per kilometre. The high fuel consumption of biogas is explained by the relatively low efficiency of the Otto engine at times when the load is light. Some of the vehicles had initially a very high consumption of oil. This has however been adjusted.

The biogas-fuelled waste collection lorries have showed to be reliable in service. No shutdowns or technical problems have been reported due to the use of biogas. The drivers do not notice much of a difference of driving biogas vehicles compared to the conventional ones. The biogas vehicles are making less noise and smell less. They are also producing a smaller amount of pollutant emissions. On the other hand the acceleration is not as good as in diesel vehicles. Also the range of the biogas lorry is shorter.

One barrier is the insecurity of the biogas supply. For the entrepreneurs this is a big concern. Occasionally the drivers have to go to many different fuelling stations in order to fill up the tank. During the years that the project has been running some positive decisions have been taken by companies to produce and distribute more biogas.

Barriers and drivers

The supply of biogas is very important. Also the distribution is of highest importance. A third important thing is that there need to be someone that are willing to pay the extra costs that it takes to operate the biogas vehicles. The project has been successful and other cities could do it as well if they feel a need to reduce the amount of noise and pollutant emissions in the city.

Lessons learned

It is more expensive to operate the biogas vehicles. The cost of the biogas vehicle (~1.3 million Swedish crowns) is approximately 30 % higher compared to a conventional waste collection lorry (~ 1.0 million crowns). To use diesel as fuel costs about half the price compared to biogas.

Financing aspects

The oil consumption has been very high, up to 14 liter/1000 km. this was due to fault in the vehicle (vevhusventilationen). After modifications the oil consumption has been the normal one.

The total energy consumption has increased by 40 % due to that the use of the Otto engine when driven at low load have a significantly higher fuel consumption than a diesel engine at low load. The long periods of standing still and having short distances in-between the stops means low load on the engines. The costs for service have risen from 0.033 Euros/km to 0.045 Euros /km. The increase is a result of the change from the diesel engine to the Otto engine. Otto engine demand more service and change of parts.

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4.44 Widening of the Environmental Zone (Stockholm)

Trendsetter

CIVITAS Project

Access management

Measure field

Not implemented

Status

(The zone could not be expanded as planned within Trendsetter, which is why the focus of this measure has been to higher the obedience level.)

Since 1996 there is an Environmental Zone for heavy vehicles and buses in the central area of Stockholm. Within the zone diesel engine driven heavy trucks and buses are prohibited to drive if they are older than 8 years. Approximately 10 % of the heavy vehicles in the zone did not obey the existing rules in year 2000. In this measure the existing environmental zone in Stockholm with access restriction for heavy vehicles older than eight years could not be expanded as planned. So instead the measure put focus on improving the obedience level, which had succeeded through cooperation and improved information between the city's Traffic administration and the supervising Police authority.

Measure description

- Widening the environmental zone restrictions for heavy goods vehicles and increase the obedience of the rules.
- Provide other cities with best practice strategies.
- Less emissions and noise in the city centre.
- Less energy consumption due to cleaner and more efficient vehicles leading to a more sustainable city.
- Increase acceptance of clean vehicles.
- A more attractive city centre.

Objectives, innovative aspects

Widening the environmental zone: One part of the measure was to widen the environmental zone, so that a newly built area, called Hammarby Sjoestad, would be included in the zone. This new area is only partly completed, probably because there has been a recession that has delayed the whole project and it will take some years before it is completely finished. The widening of the environmental zone will probably take place after the Trendsetter project is finished when all the housing projects have been completed.

Implementation

Obedience to the environmental zone rules: The environmental zone in Stockholm was implemented the 1st of July 1996. From 1997 the obedience to the environmental zone rules have been checked, with about 350 to 500 inspected vehicles each year. The inspection has taken place in two locations in Stockholm, one in the southern part and the other in the northern part of the city. In 1997 only 2.5 % disobeyed the rules. From 1998 to 2000 a noticeable deterioration occurred and the worst year (2000), 10.2 % did not follow the zone rules. Recently there has been an improvement and in 2002 4.7 % did not follow the rules. In 2003 the disobedience was 2.5 % and in 2004 it was 3.8 %. During the last three years (2002-2004) the traffic administration office in Stockholm have built up contacts with the police and given them deeper information about the environmental zone rules. This contact will remain so that the obedience can be kept on a high level and the environmental zone rules can have good confidence among the public as well as among road carriers.

Spread information of Environmental zone: The Swedish cities Stockholm, Göteborg, Malmö and Lund co-operate regarding their environmental zones. Since four cities are involved there is a lot of knowledge about environmental zones among other cities and authorities in Sweden. The plan is to keep spreading information and to participate in seminars in Sweden. When it comes to other European cities, information will be spread through sending reports and brochures, participating in meetings and seminars and to give information to people who are visiting Stockholm etc. There have already been visitors from other countries in Europe and even from Asia. The traffic administration in Stockholm will continue to look after those valuable contacts and establish new ones for an exchange of knowledge and to show that there is much to gain from implementing environmental zones regarding lower emissions of NO_x, PM, noise levels etc.

The environmental zone rules is planned to be changed in the near future. In co-operation with Göteborg, Malmö and Lund, there is a plan to change the rules from age-based rules, to rules based on a combination between age and Euroclass. Better Euroclass allows the vehicle to drive in the Environmental zone for a longer time. The new rules will probably be valid from the 1st of January 2006.

The contact and co-operation with the police will continue in the future via telephone and meetings, so that the (for the moment) good obedience can be kept and hopefully even better in the future.

To widen the environmental zone will take a couple of years because the building of the area that was to be included, Hammarby Sjoestad, is not completed yet.

A parking ban for vehicles, which do not fulfil the Environmental Zone rules, is planned but it demands a change of the law. If the Ministry of Industry like this thought, the idea is to let the traffic warden help in the surveillance work. If the traffic warden can help to supervise the environmental zone there will be one more way to increase the obedience.

Another thought among the Swedish environmental zone towns, is to see if it is possible to implement environmental zones for vehicles under 3.5 tons and for vehicles with other fuels than diesel. The environmental zone towns are investigating this but it is, in this case too, a need to change the law and no decision is taken yet.

Results

In the environmental zone measure in Stockholm an interesting implementation strategy has been used. To increase the obedience of the environmental zone rules, contacts between the Stockholm Traffic Administration and the Police Department have been built up. Through meetings and telephone contacts the policemen have been given deeper information about the rules, which have made their supervision more efficient. With a high obedience level the environmental zone will gain confidence and respect among the public and the road carriers.

From the 1st of January 2006 the new environmental zone rules will be adapted to Euroclass combined with year. This means that a vehicle can get, for example 8 years in the zone if it fulfils the current Euroclass standard, and if the vehicle fulfils a better Euroclass than current one, the vehicle gets to drive in the zone during more years. For example, a vehicle, which fulfils Euro-4 when current rules only demand Euro-3, can get more years than the usual 8 years. What number of years has not been decided yet.

There is only a small difference between the Do Nothing scenario of 2004 and 2004 with Trendsetter, and this is because the environmental zone has been there since 1996 and was not expanded as expected. But the Trendsetter measure increased the obedience level to 96.2 % compared with the Do Nothing scenario of 92 %. To achieve a high obedience level is a very important aspect of environmental zones. Vehicles that are comprised by the environmental zone regulations have gradually been phased out since 1996, and only a "normal" phase out of elder vehicles was achieved within the Trendsetter period. The Do Nothing scenario therefore shows an improvement compared to some years earlier, and this improvement is not because of Trendsetter.

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Last update:

4.45 Clean urban logistics and goods distribution platform (Toulouse)

<i>CIVITAS Project</i>	Mobilis, CIVITAS II
<i>Measure field</i>	Urban distribution centre, Public private co-operation, Distribution scheme
<i>Status</i>	Ongoing
<i>Measure description</i>	<p>Definition of a new freight delivering regulation is considered as an important component in our attempts to overcome the present congestion problems in Toulouse.</p> <p>At the local level, this measure will permit to organise the freight transport and delivering and re-define the local regulation while reducing the access to the city centre and improving the management of spaces for delivery. All of these developments will permit to concretely treat the crucial problem of freight delivering and transport within the Urban Mobility Plan. The solution implemented will be evaluated including the environmental criteria.</p> <p>At the national level, due to the lack of such kind of experience, the Toulouse demonstration will permit to demonstrate and propose example in the field of freight delivering and transport.</p>
<i>Objectives, innovative aspects</i>	<p>Improve the transport and freight delivery in the Toulouse city centre by:</p> <ul style="list-style-type: none"> • Defining and implementing the basis for the management of freight traffic into the overall policy of the city of Toulouse. • Defining a new organisation of freight delivering based on the experiences of a developing co-operation with Chronopost.
<i>Implementation</i>	<ul style="list-style-type: none"> • The delivery in the city centre has been analysed. • In-depth analysis of the freight delivering regulation has been done. • Implementation of the new management of freight delivery in Toulouse starts in February 2007. • A trial with Chronopost has been carried out and the evaluation is finalised. • Technical and socio-economic evaluation. • Definition of the new regulation scenarios. • Feasibility and solutions definition studies (note that the international carrier Chronopost will participate to these studies) made of carriers, tradesmen and citizens consultation, • Creation of the steering committee. • Dissemination and experience share with local and national partners (institutions and carriers).
<i>(Expected) Results</i>	<ul style="list-style-type: none"> • Structural renew of the freight management regulation in relation with the new transport management policy and especially the city centre access restriction objective. • Development of the cooperation with the whole stakeholders concerned by the freight delivering. • Optimization of freight deliveries in the city centre and estimation of its environmental impact.

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4.46 Clean Urban logistics (Venice)

CIVITAS Project

Mobilis, CIVITAS II

Measure field

Loading and unloading, Fleet management & route planning

Status

Ongoing

Measure description

This measure focuses on the creation of a web-enabled information system for the management of temporary and permanent parking spaces along the inner canals in Venice.

Objectives, innovative aspects

To improve the efficiency and effectiveness of the management of the permanent and temporary boat parking spaces along the inner canals in Venice, through the creation of a web-enabled information system that integrates day-to-day administrative acts (requests, authorizations, etc.) and provides support to decision-makers and regulators for the integrated management of boat traffic and circulation, during ordinary and extraordinary situations. In this way, parking will be managed in a planned and controllable manner having a positive impact on the entity of traffic flows in Venice's channels.

The innovative aspect is the involvement of economic operators in the construction of the logistic scheme. This will be made with the development of an innovative model that will consider how all the deliveries are made. The attractiveness will be improved by the standards met by the vehicles used, which will be able to access everywhere at any time instead of being restricted by the limited access zone and by bus lanes. The entire scheme will be innovative, combining managing technologies and technical solutions with low impact vehicles and a modern terminal. The integration of the management of different activities would permit a rationalization of the use of docks, reducing traffic congestion as well as wake and noise pollution in the city.

Implementation

The work consists of:

- analysis of the actual use of docks;
- recalibration of the permitted use of docks by different boat types at different times of the day and night;
- identification of boat docks to be reserved for the delivery of cargo at set times;
- identification of docks that could be used temporarily;
- management of permits for the temporary use of docks during construction/restoration work,
- management of the signage that will regulate the dock use based on the aforementioned analyses;
- development of parking management system;
- system testing and personnel training;
- integration with other information systems.

This measure is managed by the City of Venice and Forma Urbis.

A survey was carried out in order to identify the actual use of docks in order to classify the docks according to their prevailing uses. There have been meetings with local authorities and transport trade associations for identify the target delivery locations to be monitored. The "Handbook for field data collector" and the "Handbook for data collection locations"

have been made in order to realize the survey and to standardize the dock use collecting data.

Forma Urbis has produced an in-depth study about the local delivery cargo system, using the information collected during the dock use surveys in September 2005. This study gives guidelines for a decision making model about the permitted dock use and gives the general standards for the revision of the permitted use of docks by different boat types at different times of the day and night, the identification of boat docks to be reserved for the delivery of cargo at set times and the identification of docks that could be used temporarily.

The subcontract to Associazione Centro Progetti Venezia has been signed.

The temporary and permanent parking permitting system has been designed using the information collected during the dock use surveys and the analysis, the pre-existing information about parking concessions and the in-depth survey of stakeholders.

The study of administrative procedures and requested official documents for applying for the temporary use of docks during the construction/restoration work, the water parking space and the transit in the canals have been carried out. The study of the use of inner canal parking spaces and the areas experiencing traffic flow issues has been realised. In particular the interactions between parking and traffic are accurately studied. The gathered information was used to develop the Electronic Parking Management System based on a web GIS system. The network of the parking management system, the links between the different offices and the data and information exchange have been designed. The new electronic system has been designed for the request of the transit and stop permit and also to accept complaints from its users.

Forma Urbis has tested the parking management system with the Water Mobility Office staff in order to collect opinions on the final work and in order to study how this new system works with the stakeholders.

The mock-up of the designed parking management system is being developed.

A complete information system for the management of permanent and temporary parking along canals will:

(Expected) Results

- reduce the possibility of boats competing for the use of the same dock, by reserving docks for certain key activities at certain times of the day;
- reduce the waiting time to obtain concessions for parking spaces (both permanent and temporary);
- eliminate the possibility that temporary docking permits may negatively affect important services (such as deliveries or emergency services) and create traffic obstructions;
- allow Venetians to use their personal boats to conduct personal business and use docks for extended periods of time (2 hrs);
- provide constant information to decision makers for the planning of measures aimed at controlling boat traffic and reducing wake and noise pollution.

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4.47 Fleet efficiency and home delivery (Winchester)

CIVITAS Project

Miracles

Measure field

Distribution scheme

Key word

Collectpoint, freight map, waste recycling scheme

Status

Implemented

Measure description

This measure consisted of three mini-measures:

1. the Collectpoint trial, which aimed to reduce the number of missed home deliveries by using a chain of local convenience stores as a delivery point;
2. a Winchester freight map, which was distributed to freight companies and venues such as petrol stations to improve the efficiency of urban freight delivery;
3. a waste recycling scheme, which used an electric vehicle to undertake a waste cardboard and paper recycling service for Winchester city centre businesses.

Freight maps showing routes, destinations and vehicular restrictions have been distributed to businesses and local service stations, while recycling collections from businesses have been made with electric van. Five locations of Collectpoint have been set up: it's the alternative service to home delivery, primarily to internet shoppers.

Objectives, innovative Aspects

- reduce the number of missed home deliveries;
- increase the efficiency and use of urban freight delivery; and
- initiate an urban waste-recycling service using environmentally friendly vehicles.

The main innovative aspects were

- the use of local convenience stores to act as delivery points for carriers, re-directing missed deliveries to householders; and
- promotion of a business cardboard and paper recycling scheme using electric vehicles.

Implementation Status

At the start of the project detailed surveys of over 450 shops and businesses in Winchester were carried out. The surveys examined freight patterns and developed an understanding of the problems encountered when delivering goods and services. Discussions were held with a number of companies regarding the feasibility of alternative delivery systems in Winchester. One such company was Collectpoint plc, who offer an alternative to home delivery, primarily to internet shoppers. Collectpoints are located in convenience stores, and provide an alternative delivery address for purchases. The main benefit of this service is the reduction of failed and subsequent return deliveries made by couriers and postal services.

With support from MIRACLES, Collectpoint plc expanded their service within the city, resulting in a total of five locations. MIRACLES widely publicised Collectpoint and offered a ten week free trial of the service

during summer 2004. Feedback from initial surveys resulted in the free trial being extended until Easter 2005.

A Winchester Freight Map was produced for road freight operators and drivers of commercial vehicles, showing appropriate routes, the main delivery destinations, and vehicular restrictions. Two thousand maps have been distributed to local service areas, filling stations and Winchester businesses.

Dove Recycling are a company making recycling collections from Winchester businesses. MIRACLES have been working in partnership Dove Recycling since February 2005, and provided a Citroen Berlingo electric van for their collections within the city. The collection service aims to replace predominantly diesel van journeys with electric van deliveries, resulting in 100% reductions in tailpipe emissions.

On average one in five parcels in Winchester fails to be delivered first time, indicating there were potential benefits to be gained from an alternative delivery option, in reduced time and distance travelled. However, the initial Collectpoint trial was marred by technical difficulties and few people used the service. The lack of data meant it was difficult to assess whether the scheme would have been commercially viable, although the trial indicates it would not. For such a scheme to be successful internet retailers would need to incorporate it into their system as an alternative delivery option.

Results

The freight map which was distributed to service areas was thought to be a useful tool for delivery drivers.

Before the waste recycling collection trial, 68% of businesses said they did not recycle, 66% employing SERCO to collect their waste using a 26 tonne heavy-duty diesel refuse vehicle with the waste eventually going to landfill. From small beginnings, collecting a tonne of paper and cardboard a month, the recyclable waste collection service appears to be a commercially viable venture for Dove recycling, since they now operate the service on a full-time basis and have expanded the scheme to other towns in Hampshire.

The Air Quality Action Plan (AQAP) was a main driver for this measure with potential emissions savings made from collecting recyclable waste with an electric van and reducing the number of failed home deliveries with Collectpoint. Many businesses used the waste recycling service in order to demonstrate their 'green' image with their customers. The disbanding of the B to C arm of Collectpoint in addition to technical problems with its website resulted in a fully operational trial not being implemented. Resistance to change from the internet retailers and customers until the scheme has shown to be successful was a barrier to its implementation.

Barriers and drivers

The initial Collectpoint trial was marred by technical difficulties and only a few people used the service. This lack of data means it is difficult to assess whether the Collectpoint scheme would have been commercially viable, although this trial indicates it is not. For such a scheme to be successful, internet retailers would need to incorporate it into their system as an alternative delivery option. A successful demonstration may be needed for this to happen.

Lessons learned

Awareness of the freight map with Winchester businesses was low (3%). No evidence was collected to show that the freight map was used by freight companies, although some subjective comments suggested that the simplified map was useful.

Whilst such a map could have been a useful tool for freight drivers, most likely picked up at service areas and filling stations, it was considered that the maps sent to businesses, which were generally not sent to a particular person, may not have reached those who might have benefited most.

Within the waste recycling collection trial, only a relatively small amount of recyclable waste was collected, typically about one tonne per month. Nevertheless, this appears to be an economically viable venture for the company running the scheme since the service is operated on a full-time basis. A client base of 35 Winchester businesses has been established and the scheme has been expanded to other towns in Hampshire. In addition, the participating Winchester businesses saw the use of an electric van as a worthwhile public relations exercise to enforce the impression that they are a 'green' company.

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