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Cluster Report 4: Logistics and Goods Distribution

Deliverable: D2.2

Authors: Prof. M.McDonald, Dr. R.Hall, A.Hickford
Transportation Research Group
University of Southampton

Prof. G.Sammer, O.Roeder, Dr. R.Klementsitz
Institute for Transport Studies
University of Natural Resources and
Applied Life Sciences (BOKU), Vienna



THE CIVITAS INITIATIVE
IS CO-FINANCED BY THE
EUROPEAN UNION

Contract no: TREN/O4/FP6EN/S07.39318/513559

Start date 1st January 2005

Duration: 61 months

Version: Final

Date: 29th January 2010

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1 Introduction

Freight in urban areas is a longstanding problem. It is essential to the success of cities and yet conflicts with other demands, such as flowing traffic, peaceful environment, pedestrian and cyclist comfort, etc. in CIVITAS, a number of innovative projects were developed to try to tackle the apparently intractable problem of deliveries into cities. These measures have shown some valuable insights into the time-frames and conditions needed for freight solutions, and the importance of partnerships. There are some positive results to build on, but a great deal remains to be learned in this area.

The 17 measures within this cluster have been divided into 3 main sub-clusters:

- (a) New distribution schemes - their regulation and deployment (8 measures)
- (b) Vehicle and driver support (6 measures)
- (c) Freight partnerships (3 measures)

Table 1.1: Logistics and Goods Distribution related measures

City	No.	Measure Title	Outline Description	Success of implementation ¹	Success of outcome ¹
(a) New distribution schemes					
Burgos	10.2	New goods distribution scheme	Design and develop integrated regulation scheme; use of 'clean' vehicles (not implemented)	1	1
Genoa	10.1	Enlarged goods distribution scheme	Design and develop access regulation scheme; van sharing scheme; 'mobility credits' scheme (implementation process underway); 'proximity' warehouses (not implemented)	1	1
Krakow	10.3	New goods distribution scheme	Use of 'clean' vehicles (not implemented); assessment of 'mobility credits' scheme	1	-
La Rochelle	10.1	City logistics strategic extension	Optimise current logistics platform; develop warehousing and delivery software tool; new 'clean' vehicles (not implemented)	2	3
La Rochelle	10.2	Customer services associated with goods distribution	Extend B2B (Business to Business) activities to include B2C and C2C (Customer to Customer) activities, using P+R (Park & Ride) facilities	3	3
Norwich	10.5	Urban consolidation centre [joint with 10.3 & 10.4]	Development of urban consolidation centre	0	0
Norwich	10.6	Goods delivery to Park & Ride sites	Promotion of P&R use by enabling customers easier transport and storage of goods purchased in city centre	2	0
Toulouse	10.1	Clean urban logistics and goods distribution platform	Access restrictions; development of urban delivery centre (not implemented); use of 'clean' vehicles	1	1
(b) Vehicle and driver support					
Malmö	10.1	Freight driver support	Computer-based environmental and distribution information system	0	0
Malmö	10.7	Sustainable SME logistics for the food industry	Web-based logistics coordination system; use of 'clean' vehicles (not implemented)	0	0
Norwich	12.8	Customised traffic and travel information service for freight operators	Web- and mobile phone-based information service; greater use of clean vehicle technologies (not implemented)	0	0
Ploiesti	10.6	Freight partnership, planning, routeing, signing	Promote cooperation between operators; improve signing; encourage best practice	1	3
Preston	10.5	Freight routeing and signing	Improve routeing and signing	2	3

City	No.	Measure Title	Outline Description	Success of implementation ¹	Success of outcome ¹
Venice	10.2	Clean urban logistics	Web-enabled information exchange for canal boat parking management	3	3
(c) Freight partnerships					
Norwich	10.3	Development of Strategic Freight Stakeholders Club [Joint with 10.4 & 5]	Promote cooperation between operators (not implemented fully)	0	0
La Rochelle	10.3	Development of partnership with logistic operators	Promote cooperation between operators	1	3
Preston	10.4	City logistics partnerships and strategic planning	Promote cooperation between operators	2	3

Note 1: Rating of success: 0=not successful, 1=moderately successful, 2=successful, 3=very successful

Table 1.1 also shows the ratings of success of the measures in relation to the implementation process and the outcome. The estimated ratings were made by the CIVITAS projects themselves and collected at the end of the project. In relation to other clusters, cluster 4, Logistics and Goods Distribution related measures, is characterised by low success of the implementation process and low success of the outcome.

2 Implementation

2.1 New distribution schemes

- Assessment of freight delivery flows, operating modes and freight regulations

As a first step, analysis of the goods flows within defined areas can identify and quantify these flows and determine routes, schedules, transported goods and the requirements of specific target groups. Moreover, it can lead to a detailed analysis of the operating modes and foreseen improvements. The analysis of existing freight regulations could help to identify the legal requirements and limits of the measure.

- Consultation of stakeholders

The consultation of stakeholders (e.g. carriers, shopkeepers as well as city logistic experts) is important to communicate the project's goals and to allow discussions and input from the parties involved. Working groups could be established to discuss the key issues and to exchange information. It has to be kept in mind, that there are severe differences between small and big carrier companies, as well as different requirements of the transported goods (e.g. cold storage).

As a second step it is important to communicate new routes and timetables with the personnel themselves (Burgos).

- New operating modes and distribution schemes

- Including urban freight deliveries within public service

There is the possibility of giving the local authority some control of the goods flows within the urban area by including certain freight deliveries within public service. This could be done by developing new mobility services such as electric car-sharing, electric/hybrid park-and-ride shuttles (La Rochelle) or by offering a van-sharing service (Genoa).

- Additional service for certain goods distribution

Another way of enabling new distribution schemes is to install a logistics platform offering electric vans and motivating stakeholders to use these vans instead of their vehicles to transport goods. Craftsmen and shopkeepers can use them like car-sharing vehicles to transport goods to and from their economic activities. The service could be restricted to certain products such as fruit, vegetables or fish, as many individual people do their shopping at distant markets (La Rochelle). In addition, a study could be undertaken to assess the costs that can be charged for the new service. In the city of Genoa eco-compatible vehicles are offered at four different car parks. The city of Malmö enforced a service of regional organic goods distribution from farmers to purchasers (private customers, restaurants and shops) with low emission vehicles.

- Organised (home) delivery services

A collective transport system may decrease costs of home delivery and therefore avoid specific travel to purchase certain goods or help people to transport heavy or large goods. Customers order their desired products from an on-line catalogue, pay either with credit card or check note and their order is prepared and delivered at certain times of the day (e.g. twice daily or every hour between 11 am and 3 pm). The delivery points are locked boxes usually at park-and-ride facilities. The products are put into specific baskets before being transferred to a specific park-and-ride facility where they can be picked up. The code of the locked box is given to the customer by electronic message (La Rochelle). The delivery points could also be staffed park-and-ride facilities and customers could be charged a small amount of money for this service (Norwich). As a starting point it is advised to cooperate with existing, similar delivery services as there might be little will to install new services or to accommodate new park-and-ride sites.

- Offering temporary warehousing facilities

To reduce duplication of trucks carrying good into city centres, temporary warehousing facilities (e.g. a "proximity" warehouse in Genoa) could be set up and equipped (e.g. with electric trolleys) for

shopkeepers and craftsmen, where they can store goods, products or material for delivery and respectively pick up their material on demand. At these facilities small units of goods can be stored temporarily and used as an alternative to traders using their own car.

- Mobility credit system (see also Cluster 8 – Access and Parking Management)

A mobility credits system is designed to give businesses in road pricing areas some relief from pricing, allowing a number of ‘credits’ for free deliveries to each business. It can be supported by PDA-based software (Krakow). The initiation phase has to deal with the analysis for adjusting and calibrating the system e.g. access restrictions for certain types of goods transported, the destination, the effective load carried or the type of vehicle engine among others. The areas chosen for pricing and access control could be picked by their attributes, such as being a strong attractor with important commercial texture and limited space for goods distribution (Genoa). The access in Genoa is with RFID-cards and readers at gates. Important aspects of this measure are related to the permissions and privacy problems.

- Regulation and restriction of freight delivery

Restricting delivery for vehicles to a certain tonnage or to certain areas (only on dedicated parking places) or at certain times requires good access control. Carriers using clean vehicles could be marked by stickers and be allowed to deliver freight in a wider time window than other vehicles (Toulouse).

- Marketing and promotion activities

To promote the measure, leaflets in different languages could be produced as well as a contact point or another kind of front office facility. Educational campaigns and marketing could promote the new goods distribution strategy and achieve a higher social acceptance.

2.2 Vehicle and driver support

- Screening and selection of target groups and suppliers

The development of technical assistance for vehicles and drivers could start with the screening and selection of suppliers and logistics partners e.g. for technical items such as vehicle computers for vehicle data (fuel, emissions etc) and route planning (Malmö) or for the development of a web-based IT-solution for logistics operators. It is also important to assess the freight users’ needs and priorities through consultation (Norwich).

- Development of technology based support

One option is a customised viewer or map for freight companies to provide up-to-date traffic and travel information such as road closures (permanent or temporary), highway works, traffic signal failures or other information worth knowing.

Another IT-based support might be the development of a web-based trading tool, initially analysing supply and demand, product flows and development potential, thus identifying market opportunities (Malmö). In addition, software can provide route suggestions in accordance with the current traffic situation (Preston). A public interface for web-based parking/loading permit applications facilitates and expedites the permission progress (Venice). In addition a GIS map with site-related parking information could be offered to visualise data in tables, graphically and geographically.

- Regulation of transport routes and delivery locations

The restriction of traffic for heavy vehicles as well as their guidance on special routes can improve traffic circulation in city areas and prevent uninformed drivers using routes not suitable for their vehicles (Ploiesti). In some cases, the route itself is not the problem, but the delivery locations – in Venice, the docks. Schemes can be devised for these locations based on a hierarchical, time-based system and pre-existing information about parking concessions, temporary docks, preferred cargo docks and so on. The individual boats are only allowed at the docks at different times of the day and boat docks can be reserved for the delivery of cargo at set times.

- **Upgrading of freight signing**

Conflicts may occur between delivery vehicles and other road users (including pedestrians) because of inappropriate parking of delivery vehicles or illegal entry or crossing of areas due to lack or low quality of signing. For this measure selected drivers – unfamiliar with the areas – could be asked to find a particular industrial estate from both outside the city area and then within the city without using a map. Problems with signing and route choice could be documented and help to determine routes where freight signing requires upgrading (Preston). In addition not only sign posts at important routes, but also marked loading bays in practical locations could be provided.

- **Training and recruitment of producers and purchasers**

By setting up training sessions (e.g. assisted by consultants) a continuous upgrading of web tool functions could be secured by allowing experts' and administrative input. The installation of reference groups with stakeholders could result in the recruitment of logistics project partners as well (Malmö).

- **Promotion activities**

The measure profits from being known, therefore its existence, goals and focus should be spread among the stakeholders and general public by distribution of brochures and individual contacts.

2.3 Freight partnerships

- **Identification of target groups and current needs**

The detection of target groups e.g. in collaboration with the Chambers of Trade could identify their importance and their role regarding goods flows and movement. Finding companies interested in participating could be supported by consultation including internet based virtual exhibitions, adverts in pertinent magazines as well as letters or e-mails to freight companies (Norwich).

- **Development of a connection tool**

The goal is to help craftsmen and small business managers with the transport of goods. This can be done via a web site that provides different types of data, such as generic information on urban freight and links to other sites of interest, the description of vehicles (size, volume, etc.), specific information on freight deliveries or a forum for information exchange (La Rochelle).

- **Complementary measures**

Priority lanes originally dedicated to public transport could be used by vehicles transporting goods as well (Norwich). In this case, consultation with stakeholders (police, local authorities, cycle forums) is advised, as there might be the need for new traffic rules.

3 Drivers and strategies to overcome barriers

The tables below show, by sub-cluster, the drivers (Table 3.1) and barriers (Table 3.2) encountered, as reported by the individual project teams.

3.1 Drivers

Drivers were asked about in an open question format. They were asked to be reported only if they were recognized as being more than what would normally be expected. To give a better overview and to compare the different measures with each other, categories have been created. A tick mark indicates that the specific driver was indicated at least once in the evaluation for the measure.

3.1.1 New distribution schemes

These measures were particularly supported by the commitment of local stakeholders such as shop-owners and the awareness of existing interests and needs (see Table 3.1(a)).

- Increasing revenues

Offering new efficient forms of goods delivery results in increased revenues for shop owners, as it is a way of serving additional costumers and meeting their needs.

- Existing shortcomings and needs

Solutions tackling the reduction of congestion are always welcome for drivers, shop owners, politicians and the public in general. A mobility credit system could for example reduce congestion, as it is limiting the access to the area and forces freight companies to look out for more efficient ways of transport in means of time and costs.

3.1.2 Vehicle and driver support

Measures dealing with the topic of vehicle and driver support were supported by existing efforts and restrictions as well as societal trends to improve the current situation and profited from the engagement of stakeholders (see Table 3.1(b)).

- Existing efforts to improve efficiency, sustainability and safety

Freight and delivery companies usually have a strong interest in supporting their drivers in any way as it might result in increased efficiency in the fields of administration and distribution of orders as well as reducing costs. There is a potential of better quality of delivery and reduced administrative costs as well as optimised route planning, hence more efficient use of drivers and reduced costs of unloaded kilometres.

- Societal trends

There is already a strong societal trend towards measures dealing with climate change, so a project within this context is most likely to be supported by public and political stakeholders.

- Restrictions regarding the transport of goods

Traffic management acts requiring the avoidance of congestion and keeping traffic moving can promote measures as dealt with in this cluster.

- Participative management of activities

The involvement of local authorities, transport trade associations and end users, as well as local stakeholders, can increase acceptance. Group meetings or the formation of a stakeholder's club from the very beginning of the project can support the project's progress through a common understanding

of the project goals and the possibility of sharing knowledge thus forming the project according to the stakeholders' needs and interests.

3.1.3 Freight partnerships

Measures forcing freight partnerships mainly profited from individual stakeholder commitment as well as from meeting existing effort (see Table 3.1(c)).

- Existing restrictions regarding transport of goods

Loading and unloading restrictions in city centres affect freight companies directly. City centres and residential areas are sensitive towards environmental impacts (vehicle emissions) and noise disturbance. Efficient, reliable and effectively routed operations could improve quality of goods distribution and life in the cities.

- Visible financial benefits and business efficiency

Stakeholders are drawn by the prospect of financial, time or security benefits triggered by efficiency. More efficiency means lower costs and shorter delivery times. Especially for smaller logistics operators, assistance in mileage minimisation, waste reduction, improved safety and reliability is very much appreciated. It is therefore important to show the positive effects of freight partnerships by means of numbers.

Table 3.1: Drivers

City	Measure	Driver related to above expected...				
		engagement / commitment of organisation or persons involved	experience and know-how of persons involved	support from outside the project team to implement measure	good structures / cooperation / management within project team	unsatisfying situation before and/or need to improve the situation
(a) New distribution schemes						
Burgos	New goods distribution (10.02)	✓				
Genoa	Enlarged goods distribution scheme (10.01)	✓		✓	✓	
Krakow	New goods distribution scheme (10.03)			✓		
La Rochelle	City logistics strategic extension (10.01)	✓				
La Rochelle	Customers services associated to goods distribution (10.02)					✓
Norwich	Urban transshipment centre (10.05)	✓				
Norwich	Goods delivery to P&R sites (10.06)	✓		✓		
Toulouse	Clean urban logistics and goods distribution platform (10.01)				✓	✓
(b) Vehicle and driver support						
Malmö	Freight driver support (10.01)					✓
Malmö	Sustainable SME logistic for the food industry (10.07)	✓	✓	✓	✓	
Norwich	Customised traffic & travel info service for freight operators (12.08)	✓				✓
Ploiesti	Freight partnership, planning, routing, signing (10.06)	✓		✓		
Preston	Freight routing and signing (10.05)					✓
Venice	Clean urban logistics (10.02)		✓	✓	✓	
(c) Freight partnerships						
La Rochelle	Development of partnership with logistic operators (10.03)			✓		
Norwich	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 (10.03)			✓		
Preston	City logistics partnerships and strategic planning (10.04)	✓				

3.2 Strategies to overcome barriers

As many of the projects in CIVITAS II dealt with the same or like problems (mainly financial and political issues as well as acceptance problems), the following points are not assigned to sub-clusters (see also Table 3.2).

The following strategies to overcome barriers were identified:

- **Clear definition of responsibilities**

The stringent assignment of responsibilities concerning management, financing, negotiations with suppliers and delivery deadlines can prevent delays and miscommunications. Long term funding and the provision of the required infrastructure are key to the project's success.

- **Clear communication**

A clear statement of the project's goals and benefits allows the target groups as well as the stakeholders to get a good overview of the scope and might prevent misconceptions or wrong expectations. If there have been such misunderstandings or bad experiences in the past it is even more vital to stress the focus of the specific measure. This is also important to overcome negative connotations and prejudices. The potential benefits of providing information may be increased by considering communicating and contacting the stakeholders in different ways (leaflets, brochures, mail, e-mail, telephone, etc.) instead of restricting it to one.

- **Political and stakeholder involvement**

Negotiation and coordination meetings and discussions are essential to allow politicians and other stakeholders to get a global and long term view on transport activities and to express their own behaviour, difficulties and requirements. Direct consultation could reinforce the viability of the project and motivate carriers to participate in the measure. If necessary, only one carrier or a small group of carriers could initiate the process, as it might be impossible to attract all the freight operators.

- **Budget control unit**

Some measures and systems can not be implemented partially, only totally. Therefore a stringent cost control unit (e.g. a local committee) could be installed to deal with occurring cost increases (e.g. by implementing a contingency plan).

Table 3.2: Barriers

City	Measure	acceptance barrier	delays during the project	financial barrier	institutional barrier	lack of labour resources	legal barrier	management barrier	market barrier	organisational barrier	political barrier	spatial barrier	technical barrier
(a) New distribution schemes													
Burgos	New goods distribution (10.02)			✓	✓		✓			✓	✓		✓
Genoa	Enlarged goods distribution scheme (10.01)	✓			✓						✓		✓
Krakow	New goods distribution scheme (10.03)									✓	✓		
La Rochelle	City logistics strategic extension (10.01)						✓	✓		✓			✓
La Rochelle	Customers services associated to goods distribution (10.02)	✓		✓							✓		
Norwich	Urban transshipment centre (10.05)	✓		✓			✓						✓
Norwich	Goods delivery to P&R sites (10.06)			✓						✓			
Toulouse	Clean urban logistics and goods distribution platform (10.01)	✓		✓				✓			✓		
(b) Vehicle and driver support													
Malmö	Freight driver support (10.01)	✓											
Malmö	Sustainable SME logistic for the food industry (10.07)	✓											
Norwich	Customised traffic & travel info service for freight operators (12.08)	✓		✓									✓
Ploiesti	Freight partnership, planning, routing, signing (10.06)									✓			
Preston	Freight routeing and signing (10.05)			✓									
Venice	Clean urban logistics (10.02)		✓							✓			
(c) Freight partnerships													
La Rochelle	Development of partnership with logistic operators (10.03)	✓						✓			✓		
Norwich	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 (10.03)	✓											
Preston	City logistics partnerships and strategic planning (10.04)							✓	✓				

4 Impacts

4.1 New distribution schemes

Five of the eight measures in this sub-cluster of new distribution schemes concern the development and promulgation of access restrictions to the current delivery network, three of which also promote use of ‘clean’ vehicles; one measure concerns the optimisation of the current distribution platform, including the use of ‘clean’ vehicles; the remaining two relate to promotion of a purchased goods collection and drop-off facility at Park and Ride facilities. A summary of the outputs and impacts is given in Table 4.1.

Table 4.1: Achieved Outputs and Impacts for New distribution schemes

City	No.	Outputs	Economy Energy Environment	Transport	Society
Burgos	10.2	<ul style="list-style-type: none"> Promulgation of new distribution strategy and regulation scheme reduction in number of goods vehicles in pedestrian areas 	Not recorded	<ul style="list-style-type: none"> Overall average vehicle speed reduced slightly from 20.4 km/h to 19.6 km/h, 04-07 (although increased average speeds in some locations) greatest reduction in average speed during 2006 early implementation, but increased again since then freight movements in the controlled area, 460 per day to 240 per day, 04-07 	<ul style="list-style-type: none"> Stakeholders’ awareness of distribution strategy increased from 42% to 65%, 07-08 stakeholder respondents who would take part in the strategy increased from 74% to 87%, 07-08
Genoa	10.1	<ul style="list-style-type: none"> Promulgation of new access regulation scheme Van sharing service; 6 vehicles, 20 month pilot scheme 	Not assessed	<ul style="list-style-type: none"> Slight increase in number of trips using van sharing scheme, Jan 07 to Sep 08 Slightly better route choice and reduced journey time, 07-08 	<ul style="list-style-type: none"> 61% of respondents thought the mobility credits scheme would help alleviate current problems
Krakow	10.3	<ul style="list-style-type: none"> Testing and assessment of points-based ‘Mobility Credits’ scheme (4 weeks) 	<ul style="list-style-type: none"> 76% of locals, tourists and retailers thought noise levels were not high, Jun 07 	<ul style="list-style-type: none"> Most private vehicles would be unaffected by introduction of Mobility Credits scheme 	Not assessed
La Rochelle	10.1	<ul style="list-style-type: none"> Redeployment of declining distribution activities of ELCIDIS logistics platform development of warehouse and delivery software tool 	<ul style="list-style-type: none"> Slight increase in storage activities 07-08 overall, 48% of operating costs are staff-related 	<ul style="list-style-type: none"> Journey distances per customer vary considerably on a monthly basis, due partly to low numbers of businesses using the service 	<ul style="list-style-type: none"> 50 carriers contacted by ELCIDIS 1 regular carrier using ELCIDIS platform, with 5 or 6 other occasional users

City	No.	Outputs	Economy Energy Environment	Transport	Society
La Rochelle	10.2	<ul style="list-style-type: none"> Extension of delivery services, involving use of P+R as pick-up point for goods purchased in participating stores using electric vehicles as part of ELCIDIS distribution platform 	<ul style="list-style-type: none"> B2C around €2000 to €2500 turnover per month, 07-08 B2B around €50 to €100 turnover per month (except Feb, Mar 08, turnover at €400, atypical activity from one customer) 	<ul style="list-style-type: none"> Around 40-50 deliveries per customer per month delivery vehicles travelled around 2000km per month, around 6 km per delivery 	<ul style="list-style-type: none"> 30% increase in awareness of potential users of the service
Norwich	10.5	<ul style="list-style-type: none"> Establishment of Freight Consolidation Centre some goods vehicles able to use bus lane to access city centre 	<ul style="list-style-type: none"> Around 300 litres of fuel saved (88 trips, 0.113 litres/vkm saved) Reduction in CO₂ emission of 1360 kg, equivalent to 517 g/vkm 	<ul style="list-style-type: none"> 88 trips made to consolidation centre during 12 month period 	<ul style="list-style-type: none"> 2% increase (7% to 9%, 07-08) in awareness of specific scheme 45% increase (8% to 53%) in awareness of general use of bus lane by goods vehicles
Norwich	10.6	<ul style="list-style-type: none"> Shop & Go service for Park & Ride users at 3 locations, to allow goods purchased in store to be delivered to P+R sites for subsequent customer pick-up 	<ul style="list-style-type: none"> No operating costs given future operating costs could be reduced by limiting times available for goods collection 	<ul style="list-style-type: none"> 335 crates were used during Nov/Dec 07 60 customers had not previously used the Park & Ride facility 	<ul style="list-style-type: none"> 212 respondents (26%) were aware of the service 84% of these 212 respondents felt they would not use the service at all 4% of these 212 respondents said they would consider using the service more than once a month
Toulouse	10.1	<ul style="list-style-type: none"> New delivery regulations imposed use of local mail delivery service as others goods distributor use of electrical vehicles 	<ul style="list-style-type: none"> Similar operating costs with electric vehicles, but no overall set-up costs given 58% reduction in CO₂ emissions due to use of electrical vehicles 	Not assessed	<ul style="list-style-type: none"> 34% of businesses say new delivery timetable is an improvement; 11% consider it worse 85% of deliverymen approved of electrical vehicle use in pedestrian areas

One of the notable successes of these measures is the popularity of small electric vehicles for deliverymen. Results of questionnaires distributed in May 2007 in Toulouse (pictured) indicated that 5 of the 6 delivery employees (85%) were satisfied with the use of electric delivery vehicles in pedestrian areas, and 37% of clients perceived their relationship with deliverymen had improved.

Larger schemes can take longer to bring into effect. Five of the eight measures had originally included the implementation of a centralised urban distribution centre, but only one of these was partly



realised; the others suffered largely from opposition from local businesses, or the perception that such measures were unnecessary or irrelevant. In La Rochelle, the measure had to be downscaled following the bankruptcy of the original operator. As a result, these measures have deviated from the original plans to become feasibility and impact studies of the introduction of new distribution regulation schemes.

Other measures originally planned included the introduction of new 'clean' delivery vehicles, but this only happened on a small scale for one measure, where a postal delivery business used alternative electrical vehicles when distributing an added number of goods in Toulouse.

It is not possible to generalise the results and outcomes from these measures, since there is little commonality in outputs and impacts. The following, paragraphs, however, present some of the interesting findings.

Two measures originally planned 'Mobility Credits' schemes, whereby carriers are allocated a limited number of credits which are used to pay for access to a particular area of the city. Credit costs are determined by types of vehicles and time of access. Neither of these schemes was implemented during the project, but results of telephone interviews of shopkeepers and artisans in Genoa carried out in October 2008 indicated that 61% of survey respondents thought such a scheme would help towards alleviating current congestion and associated problems, and implementation of the scheme was envisaged following the end of the project. The other 'Mobility Credits' scheme in Krakow was limited to two study periods (of a fortnight each) to assess the impact of such a scheme; most vehicles would be able to adapt reasonably well to the scheme, which would limit access to the pedestrian precinct to between 2300 and 1000 hrs (rather than the 1900-1000 hrs previously). There would be little reduction in perceived noise levels associated with this new regulation scheme, since noise levels were perceived to be at their greatest during times when access to the precinct is already limited, due to usual daily activities rather than goods distribution.

In Norwich, set-up costs were minimised by franchising the system to an existing freight operator on the outskirts of the city, instead of setting up an entirely new facility. For many other cities, costs were a significant issue. In La Rochelle, nearly half of operating costs for the distribution platform were staffing costs. The costs associated with the Shop&Go service in Norwich could be reduced by limiting operating hours, avoiding times when shoppers are less likely to use the service. A similar scheme in La Rochelle, while attracting only few clients, had a turnover of around €2000 per month. The operating costs in Toulouse for using 'cleaner' electric vehicles are not perceived as higher than previous operating costs, although this does not take account of any set-up costs of the new system.

Environmental performance modelling based on vehicle usage and characteristics indicated that there was a 58% reduction in CO₂ emissions associated with the use of electric vehicles in Toulouse, and the majority of deliverymen approved of the use of these vehicles. No other measures reported the actual or potential impact of the use of 'cleaner' vehicles as part of their new distribution schemes, although the slight increase in use of the van-sharing scheme in Genoa, together with slightly more optimisation in terms of route choice and system operation, would imply fewer emissions. Comparison of a number of modelling scenarios indicated that allowing use of bus lanes for goods vehicles in the Norwich trial would reduce journey times along corridors into the city, and could result in a reduction in CO₂ emissions of around 10g/vkm.

Comparison of mean vehicle speeds measured at various locations around the city of Burgos between 2004 and 2007 indicated that speeds were generally reduced during the operational phase of the new regulations for distribution, which involved increased access restrictions to certain areas (Measure 6.2). Still, at some points, the average speed of vehicles entering the city was unchanged or increased slightly. Further, speed reductions did not necessarily continue throughout the life of the project. However, according to manual traffic counts, the number of freight vehicles in Burgos decreased from 460 per day in 2004 to 240 per day in 2007. The impacts of the redeployment of the ELCIDIS distribution platform in La Rochelle suggested that journey distances per customer varied quite considerably on a monthly basis, mainly due to the low numbers of businesses involved in the study.

There were improvements in awareness and potential future involvement in the new regulation scheme in Burgos. Telephone interviews carried out in 2007 and 2008 indicated that while awareness of the new distribution scheme and Shop&Go scheme in Norwich also increased, 84% of the 212 respondents who were aware of Shop&Go said they would not consider using the service. A further 11% said they might use the service less than once a month. No indication was given of the potential journey savings associated with any increased uptake of the Shop&Go service in either Norwich or La Rochelle, although if the presence of the service in the future attracted car drivers to use the Park and Ride, there would be an obvious positive impact on the numbers of journeys into the city centre.

4.2 Vehicle and driver support

Three measures were concerned with the introduction of computer-based or mobile phone-based systems for information dissemination and collection, while two developed a city-wide re-routing strategy. One further scheme aimed to promote better parking strategies in Venice, including for goods deliveries (albeit boat-based rather than road transport). These are summarised in Table 4.2.

Table 4.2 Achieved Outputs and Impacts for Vehicle and driver support

City	No.	Outputs	Economy Energy Environment	Transport	Society
Malmö	10.1	<ul style="list-style-type: none"> • Technological development and testing of in-vehicle computers and route planners in 7 vehicles 	<ul style="list-style-type: none"> • Project set-up costs €200000 • benefits not assessed • full scale implementation might result in increased fuel efficiency, saving up 300 tonnes CO₂ per annum 	Not assessed	Not assessed
Malmö	10.7	<ul style="list-style-type: none"> • Evaluation of virtual marketplace for local food produce • scenario testing for potential future uptake of measure 	<ul style="list-style-type: none"> • Reductions in CO₂ emissions are likely if system reaches critical mass 	Not assessed	<ul style="list-style-type: none"> • Awareness of web tool raised slightly • acceptance levels raised through education about the web tool • 70% of stakeholders perceive the idea to have large potential
Norwich	12.8	<ul style="list-style-type: none"> • Provision of customised travel information services for goods vehicles 	<ul style="list-style-type: none"> • Companies believed using the system might save fuel, but difficult to quantify 	Not assessed	Not assessed
Ploiesti	10.6	<ul style="list-style-type: none"> • New freight routes designed and signposted 	<ul style="list-style-type: none"> • Set up costs €35000 	<ul style="list-style-type: none"> • Goods vehicle movements around the city periphery are higher as a result of the scheme banning them from the centre, 05-08 	Not assessed

City	No.	Outputs	Economy Energy Environment	Transport	Society
Preston	10.5	<ul style="list-style-type: none"> • New freight routes designed and signposted • freight maps available online 	Not assessed	<ul style="list-style-type: none"> • Some slight reduction in poorly routed freight traffic 	Not assessed
Venice	10.2	<ul style="list-style-type: none"> • Web-enabled prototype of boat parking management system 	Not assessed	<ul style="list-style-type: none"> • System could allow faster deliveries by reserving particular dock space for goods delivery 	Not assessed

The measures of vehicle and driver support varied quite widely, from an online marketplace for local produce to promote more efficient delivery systems in Malmo, to in-vehicle and en-route information systems, as well as a parking management system to utilise the dock space in Venice more efficiently, with associated benefits to goods distribution.

The original plans for three of these schemes were not implemented, so each of these measures was redefined as an assessment study, and expected outcome levels were reduced as a result. The lack of cost-effective in-vehicle technologies in Norwich and low levels of involvement from hauliers in Ploesti contributed to the difficulties encountered in these measures.

The set-up costs of the small scale test of in-vehicle systems to promote more efficient driving methods was around €200,000, including staffing costs, but no indication is given of the individual set-up costs per vehicle. Neither is there given any predicted costs incurred or benefits gained from implementing a wide-scale system. The re-routing study in Ploiesti, costing €35,000 to set up and implement, resulted in larger numbers of goods vehicles using the outer road network as expected, but no further details are given regarding the overall city-wide impact of this measure. Emissions are predicted to decrease if full implementation of these measures were to be achieved.

Again, for these measures, the development time frame is lengthy. Distribution markets are fragmented and independent, so behaviour change must be negotiated. Nonetheless, a good level of enthusiasm to work towards solutions was evidenced (e.g. in Malmö, webpage pictured).



4.3 Freight partnerships

Three cities (Norwich, La Rochelle, and Preston) initiated new logistics partnerships schemes or freight stakeholder's clubs. A summary of the outputs and impacts is given in Table 4.3.

Table 4.3: Achieved Outputs and Impacts for Freight partnerships

City	No.	Outputs	Economy Energy Environment	Transport	Society
Norwich	10.3	<ul style="list-style-type: none"> ● Promotion of Freight Stakeholder's club 	Not assessed	Not assessed	Not assessed
La Rochelle	10.3	<ul style="list-style-type: none"> ● Identification of businesses to participate in Freight Forum, and their requirements ● freight knowledge-base web site development – meetings with local businesses 	Not assessed	Not assessed	<ul style="list-style-type: none"> ● Awareness raised through 2 meetings with local businesses
Preston	10.4	<ul style="list-style-type: none"> ● Formation of Freight Quality Partnership involving local government, freight associations, businesses and other interested parties 	Not assessed	Not assessed	<ul style="list-style-type: none"> ● FQP consists of 3 Local Councils, 2 freight associations, 3 larger local businesses and 2 Chambers of Commerce

The development of Freight Partnerships or Stakeholders' Clubs was originally the main aspect of three measures, but for two of these, in Norwich and La Rochelle, significant problems were encountered in persuading local businesses to take part in such schemes. The most successful scheme appears to be in Preston, where a small number of key stakeholders and businesses became actively involved in the development of the Strategic Plan.

These measures yielded no direct results, but were designed to inform other measures within the overall project.

5 Upscaling and Transferability

A summary of the potential for upscaling and transferability is given below.

5.1 New distribution schemes

Upscaling

Of the five measures planned to establish new centralised urban distribution or consolidation centres, only one was partly achieved, in Norwich, and by the end of the project only 3 retailers were using the facility. Extending the client base by persuading further retailers to use the distribution centre, or by partnering with an existing logistics company in order to promote use to existing clients should result in greater benefits to all users. The four other measures, which were adapted to assess the potential impacts of such distribution centres, acknowledged that if such a scheme were introduced, it would be necessary to have the backing of local businesses for any upscaling of the measures to be successful.

Those measures which entailed the assessment and promulgation of potential distribution schemes tended to focus on a relatively small area, such as the historic centre. These studies could be carried out at other similar targeted locations, or to encompass a greater city region, and give further information on the effect of introducing the measure. In Norwich, the use of bus lanes by goods vehicles could be extended, or alternative priority measures put into place, such as at priority at traffic signals for particular goods vehicles.

Acceptance is potentially a difficult issue so consultation with stakeholders should be used during the evolution of regulations for distribution (Burgos pictured).

In Norwich, the use of a Park and Ride site as a drop-off and collection point for goods purchased in the city centre could be extended to the other Park and Ride sites around the city, although the scheme should be limited to the busiest times, such as the run-up to Christmas, and would probably initially be limited to one vehicle to cover the Park and Ride network. The other Park and Ride scheme in La Rochelle already covers the city, so any upscaling would be as a result of the growth of the city.

Those measures which are closely linked with other measures are likely to follow any upscaling opportunities of the linked measure; for instance the Van-sharing scheme in Genoa is likely to grow in conjunction with the car sharing scheme (measure 09.04).



Transferability

Consolidation centres should be situated at a site with good transport links to the city, so that if other cities were to adopt similar measures, particular consideration should be given to the location and access. Lack of involvement from local businesses is another aspect of these measures that would need to be addressed elsewhere.

Use of Park and Ride facilities as drop off points for purchased goods could be transferred to other locations, assuming the facilities existed, and there was sufficient level of retail and customer activity.

5.2 Vehicle and driver support

Upscaling

The test of in-vehicle advice to drivers in Malmö suggested that fuel might be saved as a result of subscribing to the system, and as more vehicles are fitted with the necessary equipment, greater fuel savings and a reduction in emissions are likely to result. The system of customised travel information for goods vehicles devised for use in Norwich might also benefit from a greater numbers of users, but this would also result in a greater need for ongoing maintenance and support costs, which might have to be met through a subscription or other payment scheme.

In Preston, there are already plans to extend the scope of the Freight Quality Partnership, and further routes could be included in the freight signing scheme.

The small-scale analysis of dock use in Venice could be extended to other areas of the city using similar methods, although the uniqueness of Venice implies that this measure is unlikely to be transferrable to other city locations.

Transferability

Bespoke online systems such as the virtual marketplace in Malmö, or software developed for a particular location, such as the information service in Norwich, could be developed for other communities, and lessons learned from these measures could help alleviate problems for future users, and help promote involvement of stakeholders. Similarly, those measures which aim to promote better freight mobility through improved signing could be adapted to other locations. Some of the methods used to develop web-enabled boat parking strategies in Venice could be adapted for use in alternative systems of parking or goods vehicle dwell-time management systems.

5.3 Freight partnerships

Upscaling

Other than inviting further businesses and other stakeholders to become involved in freight partnerships, these measures are not likely to be upscaled.

Transferability

Stakeholder involvement is essential for these measures to have a positive impact, but there were problems encountered in both Norwich and La Rochelle in persuading businesses to become involved in developing and implementing sustainable freight initiatives. Other freight partnerships could learn how to avoid similar problems.

The website designed for use by transport operators in La Rochelle (pictured) could be used as a template for similar freight partnership schemes elsewhere.

The screenshot shows the website for 'Le Transport de Marchandises en Ville' (TMV) in La Rochelle. The page layout includes a top navigation bar with links for ACCUEIL, TMV, TMV LR, FORUM, LIENS, CONTACTS, and Le transport à 2 roues. Below the navigation is a search bar and a main heading 'Le Transport de Marchandises en Ville'. The content area features a welcome message, a section for 'Actualités' (News) with dates and links, and an 'Agenda' section. Logos for CIVITAS and SUCCESS are prominently displayed.

6 Conclusions and Recommendations

6.1 Conclusions

Conclusions from the evaluation of these logistics and goods distribution measures are as follows:

1. Without partnerships between businesses, operators and authorities, measures to promote effective and sustainable logistics measures are not likely to succeed. Relationship building takes time.
2. Original plans within these measures to develop Urban Delivery or Consolidation Centres may have been overly optimistic, and were not achievable during the life of the project.
3. Introducing 'clean' vehicle technologies is likely to result in substantial savings in fuel costs and reductions in emissions, but associated set-up costs and other technical problems may result in resistance from potential stakeholders.
4. Other innovative methods of promoting efficient goods distribution, such as the use of bus lanes for certain freight vehicles, are also likely to encounter local resistance, although suitable promotion and awareness raising could help alleviate this.
5. Using the Internet and other communication technologies may help build the essential partnerships required for these measures to succeed.
6. Innovative distribution platforms based in Park and Ride facilities may only be profitable to run during busy shopping periods, such as during the weeks preceding Christmas.
7. Awareness of the problems encountered during the implementation of these measures should enable future similar measures to avoid similar problems, and make more effective progress.

6.2 Recommendations

Some general recommendations arising from this evaluation are as follows:

1. Partnerships (e.g. Freight Quality Partnerships, Freight Forums and Stakeholders' Clubs) should be developed as early as possible in the planning process between businesses, operators, end users and authorities (including political support where necessary) to promote effective identification and prioritisation of common goals and enable potential problems to be recognised. There ought to be enough lead time given for the development of relationships between stakeholders, and to allow political decision and administrative processes to take place.
2. From such partnerships and other consultation, development of Freight Strategies can help understand the requirements of freight and business operators from the surrounding transport network.
3. Alongside freight strategies, partnerships should develop relevant Marketing Strategies, to help involve local people and effect appropriate attitudinal and behavioural change. Dissemination should include local and national press, as required, to ensure media coverage offers accurate and timely information.
4. Where measures involve changes to local freight traffic management, appropriate signage should be erected to allow non-local goods vehicle drivers to follow the most suitable routes. Distribution of freight maps (particularly online) could also help guide drivers along appropriate routes.