Internal Report Cluster 1 2012

IRCL1.1

Urban Freight

Innovations and Solutions for Sustainable Deliveries

Final Version

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RE	Restricted to a group specified by the consortium (including the Commission Services)	
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List of abbreviations

Text	Text
Ah	Ampere-hour
ALU	Aluminium
ANPR	Automatic number plate recognition
BESTFACT	Best Practice Factory for Freight Transport
BESTUFS	Best Urban Freight Solutions
CL1	Cluster 1 (of BESTFACT project, dealing with urban freight)
CO_2	Carbon dioxide
CO_2e	Carbon dioxide - equivalent
DPD	Dynamic Parcel Distribution
DRSC	Dedicated short-range communications
EMKEP	Elektrifizierung von MB Kleintransportern in Entwicklung und Produktion (Electrification of Mercedes Benz Vans in Development and Production)
EnBW	Energie Baden-Württemberg
GIP	Graph Integration Platform
GIS	Geographic Information System
GPS	Global Positioning System
HEATCO	Developing Harmonised European Approaches for Transport Costing and Project Assessment
ICE	Internal Combustion Engine
IKONE	Integriertes Konzept für eine nachhaltige Elektromobilität (Integrated Concept for a Sustainable Electro Mobility)
ILOS	Intelligente Güter-Logistik im Städtischen Gebiet
IRCL1.1	1^{st} internal annual report of Cluster 1
IT	Information Technology
ITS	Intelligent Transport Systems
Kg	Kilogramme
Km	Kilometre
Km/h	Kilometre per hour
kW	Kilowatt
kWh	Kilowatt-hour
LEZ	Low Emission Zone
m^3	Cubicmetre
NO_x	Generic term for mono-nitrogen oxides NO and NO_2
NPV	Net Present Value
PE	Polyethylene
PET	Polyethylene terephthalate
PM_{10}	Particulate Matters (particles of ~10 micrometres or less)
POI	Point of Interest
PROMIT	Promoting Innovative Intermodal Freight Transport
PS	Polystyrene
RFID	Radio-frequency identification
ROI	Return on Investment
V	Volt
WP2	Work Package 2 (of BESTFACT project, dealing with Methodology)
ZEB	Zero Emission Boat

1 Introduction of Cluster

1.1 Current situation in the field

Road-based freight transportation operations provide the goods and services required by companies and final customers, and make an important contribution to employment, thereby playing a vital role for the economy. But goods transport operations also cause social, environmental and economic impacts in across the world including traffic congestion, air and noise pollution, greenhouse gas emissions, and the consequences of traffic collisions. These impacts result also in direct and indirect health problems for the population exposed to pollutants and bad air quality.

Urban freight transport is a contributor to all of these negative impacts, and has increased its impacts over recent decades as urban populations and geographical settlement areas have grown resulting in the demand for ever-more freight flows to support these inhabitants and the resident businesses.

Over time more data is becoming publicly available, resulting in a greater opportunity to carry out relevant analysis of urban freight transport operations. For example, a large French distributor with a fleet of more than 5,000 vehicles and 120 logistics depots claims that 50% of the total delivery costs and more than 60% of total CO2 emissions of its national activities are accounted for by activities in urban areas (personal interview, 2012). This makes urban freight one of the key areas for innovation in the freight transport sector.

One of the objectives of sustainable urban freight transportation is to develop policies, business and technological solutions that help to reduce these negative impacts. No single solution is capable of solving all these problems. Therefore, a range of potential sustainable solutions have emerged in recent years. These solutions have been developed by a variety of actors from the public sector, industry and the research community.

The diesel-powered combustion engine continues to dominate the goods vehicle market and while efforts have been made to develop clean vehicles and vehicles powered by alternative fuels, these represent a very small percentage of the fleet.

Changes in business practices and logistics innovations have the ability to make the entire supply chain and distribution system more sustainable. Companies are increasingly reporting the social and environmental consequences of their activities.

1.2 Cluster topics

The following broad topics were selected as relevant through the application of the BESTFACT best practice selection methodology to the field of Urban Freight (see IR2.1 WP2 report).

- Consolidation centres and clean vehicles: All activities surrounding the establishment and running of clean vehicles and the reorganisation of urban freight depots to accommodate these vehicles and to increase the degree of load consolidation (i.e. improve vehicle load factors).
- Efficient use of public street space with routing and loading bay management: Technological innovations aimed at reducing the traffic impact and the distance travelled by goods vehicles in urban areas such as IT supported routing and loading bay information and access regulations using Multi Use Lanes.
- Delivery Management: Efficiency gains in delivery operations, for example with a retail sector system of cooperation and sharing of distribution centres and fleets.
- Waste Management: IT innovations applied to the specific needs of waste collection vehicles and operations.

- Modal Shift Using Urban Waterways: Use of rivers and other waterways to deliver goods in the urban area.

The selection process started with the submission of a list of examples by the partners of Bestfact participating in Cluster 1. The selection criteria for submitting an example were:

- Innovation
- Impacts
- Data availability
- Transferability

A total of 93 examples were submitted until October 2012. Each example received a ranking for each of the four criteria, and a calculated average. The calculated average was used to provide further information about the initial list of 93 examples. From these 93 examples 15 were selected and these were written up in greater detail as cases. These 15 cases form the 2012 'inventory of cases' and are presented in Sections 2.2.1 to 2.2.15. Two of these 15 cases have been the subject of further work to prepare an 'in-depth survey' (see Sections 2.2.1 and 2.2.2). The selection of the 15 cases from the 93 examples submitted took account of a number of factors over and above a simple ranking of the calculated average score. The 15 cases were chosen to provide insights into a range of possible initiatives covering a broad geographical area and involving various public and private sector partnerships.

1.3 Challenges relating to cluster and topics

Urban freight transport is subject to many challenges, and there are many types of innovative solutions that can be developed that aim to diminish the negative impacts.

Among the numerous problems mentioned by experts and practitioners, the following list of urban freight challenges was developed from BESTFACT activities carried out in 2012 including meetings and workshops organised, case studies and inventories collected and interviews with operators:

- High costs of electric vehicles
- Benefits are difficult to quantify
- Diesel fuel is dominating the market
- Technical difficulties in running alternative fuelled vehicles
- Cooperation for shared use of consolidation centres is difficult
- Lack of IT use for many small companies
- Lack of affordable logistics space within the urban area

In the inventory below, details are given on the specific cases where these difficulties were encountered and how the businesses and stakeholders were dealing with these difficulties.

1.4 Overview of inventory cases

15 'inventory cases' were prepared in 2012 (see below).

Consolidation centres and clean vehicles:

- Gnewt Cargo electric delivery in London
- Electric vehicles use in parcels deliveries in Stuttgart-Ludwigsburg
- Distripolis in French cities
- Interporto Padova
- Utrecht Cargo Hopper
- Binnenstadservice in The Netherlands

- Berlin tests of BentoBox in a Laboratory area for urban logistics innovations [1]

Efficient use of public street space with routing and loading bay management

- Vienna ILoS system on traffic information supported routing
- Iladezonen system spreading loading bay availability information in Vienna
- Multiuse lanes for freight distribution in Bilbao

Delivery Management

- Efficient delivery management for trade fair in Basel
- Network of four Urban Retail Distribution systems in Lithuania

Waste Management

- Efficient waste management in Maribor

Modal Shift Using Urban Waterways

- Utrecht Zero Emission Boat
- Retail delivery using the river Seine in Paris

In-depth surveys

In 2012, three In-depth surveys were performed based on the cases developed in Sections 2.1.1 to 2.1.15.

- Utrecht freight policy
- Gnewt Cargo in London
- Logistics tool for delivery management for trade fairs, Messe Basel

Further cases presented in Cluster 1 workshops in 2012

In 2012, two Cluster 1 Workshops have taken place in Amsterdam and in Brussels. For the following cases, presentations are available and case inventories and/or in-depth surveys are planned and under preparation. Further cases will be finalised and presented in 2013.

- FORS Freight Operators Recognition Scheme in London
- Logistics hotels, shared consolidation space in Paris
- Slow logistics in Netherlands
- Brussels Region Freight Plan
- Ecopostale parcels deliveries with electric cycles in Brussels

Relevance for innovations in Small and Medium sized Enterprises (SMEs)

All cases presented and analysed in 2012 are potentially relevant for future business practices of SMEs. The main sectors of interest are logistics and transport, IT hardware and software, and the vehicle manufacturing. The categories of future potential SME activities are either generation, adoption or diffusion of best practice, depending on the cases.

[1] The case focuses on the BentoBox implementation. However the context for this is that the initiative took place within an area that the city of Berlin has identified as being a ‘laboratory test zone for urban logistics innovations’. This development by the city of Berlin is interesting and may be of wider applicability and we will consider this in the 2013 and 2014 collections of cases.

2 Cases

This section provides information on the 15 Cluster 1 cases that were collected and developed into detailed cases during 2012.

2.1 Inventory format

In this section each inventory case is presented using the BESTFACT format provided by WP2.

2.1.1 Electric tricycle and vehicle use in retail distribution in London

1. Basic information	
1.1) Identification	Gnewt Cargocycle and electric vehicle use in retail distribution
1.2) Cluster	1 (clean vehicles and consolidation) 2 (green logistics)
1.3) Responsible authors/	Jacques Leonardi, University of Westminster

2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Retail, freight operator, local authority.
2.3) Geographical Area	UK, London
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	100% battery electric powered fleet is in operation since May 2010.
2.5) Date of implementation	Starting with the creation of the start-up company Gnewt Cargo in 2009
2.6) Link to other clusters	• Cluster 1 Use of clean (electric) vehicles linked with Use of Consolidation Centre; Cluster 2 Use of clean vehicles • Cluster 3 methodology for assessment of costs and benefits, and CO2 impacts of the solution

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☒ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☒ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☒ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td>Before: 100% diesel vans; after: 100% battery electric vehicles: Cargo-cycles and small electric vans</td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Additional small consolidation centre close to the delivery area. High density of customers in the delivery area.</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☒ Image
☐ Increased safety and security
☒ Others: Social entrepreneurship</td></tr>
<tr><td colspan="2">For both actor groups:
☒ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td colspan="2">Creation of a new company with job creation and employment effects</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☒ Quality of services ☐ Reduced congestions ☒ Reduced emissions ☒ Reduced climate change ☒ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…
2.12) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

3. Best practice	
3.1) Description of the practice	A new urban consolidation centre was established close to the Tower of London in the City of London. This consolidation centre was used as a transhipment facility for the transfer of parcels from the suburban depot onto electric vans and tricycles and for overnight storage of the electric vans and tricycles. Because the centre itself was small (approximately 20 metres by 8 metres) it was referred to as an "urban micro-consolidation centre". The urban micro-consolidation centre and the deliveries made from it were operated by the new company specialising in green urban freight deliveries, on behalf of the office supplies company. An 18-tonne goods vehicle was used to transport parcels from the office supplies company's warehouse in the suburbs of London to the micro-consolidation centre in the City of London (a distance of 30 kilometres – only 1 kilometre of which was in the City of London). The delivery was made overnight from the office supplies company's suburban warehouse to the consolidation centre in the City of London. Electrically-assisted cargo tricycles and electric vans were used to make parcel deliveries from the urban micro-consolidation centre to customers in the City of London. The operation of these vehicles did not result in any fossil fuel consumption or greenhouse gas emissions as the electricity they used was produced from renewable sources. In the initial stages of the trial heavier, bulkier products than parcels continued to be delivered directly by the office supplies company to customers using diesel-powered vans from the suburban depot (in the same way as before the trial). However by the end of the trial diesel van deliveries from the suburban depot had ceased and all deliveries were made via the micro-consolidation centre using and electric vans and tricycles.

3.2) Technical main characteristics	The electrically-assisted cargo tricycles (Picture below under point 5.5) were manufactured in France by La Petite Reine. The empty weight of the tricycle is 110 kg, including the two batteries (i.e. without the driver and load weight). It can carry a load of up to 180 kg and has a load space of 1.5 cubic metres. It is 2.35 metres long and 1.03 metres wide and has a typical speed of approximately 15 kilometres per hour in free-flow conditions. The tricycle requires a four-hour recharging overnight. Aixam Mega electric vans were used in the trial (Picture below). They had a load capacity of 445 kg and a load space volume of 3 cubic metres. Their external length was 3.32 metres and their width external was 1.49 metres. The vans require an overnight recharging.
3.3) Success factors	Creation of a new company supported by the retailer. Positive support from the local authorities.

3.4) Main benefits

Following Table 1 shows a comparison of the distance travelled and greenhouse gas emissions before and during the use of electric vehicles.

Table 1: Distance and emissions before and during use of electric vehicles

	Before use (Oct 2009)	***During use (July 2010)***
Fleet mix used	No micro-consolidation centre - 7 diesel vans only	Micro-consolidation centre - 0 diesel vans, 6 tri-cycles, 3 electric vans, 1 diesel truck
Distance travelled in the City of London		
Kilometres per parcel	0.06	0.27
Change compared with before trial	-	***349%***
Distance travelled rest of London		
Kilometres per parcel	0.36	0.07
Change compared with before trial	-	***-82%***
Distance travelled in all of London		
Kilometres per parcel	0.41	0.33
Change compared with before trial	-	***-20%***
CO_2e emissions in City of London		
CO_2e per parcel (kg)	0.020	0.003
Change compared with before trial	-	***-83%***
CO_2e emissions in rest of London		
CO_2e per parcel (kg)	0.122	0.062
Change compared with before trial	-	***-49%***
CO_2e emissions in entire system		
CO_2e per parcel (kg)	0.142	0.065
Change compared with before trial	-	***-54%***

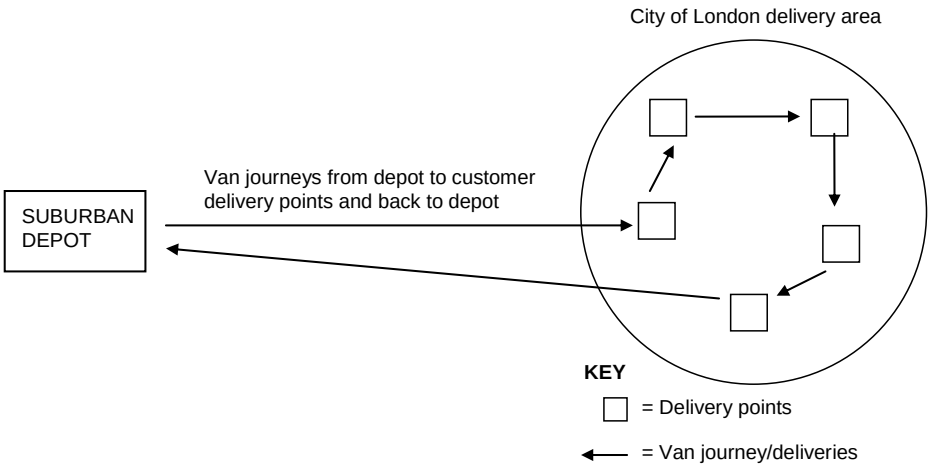
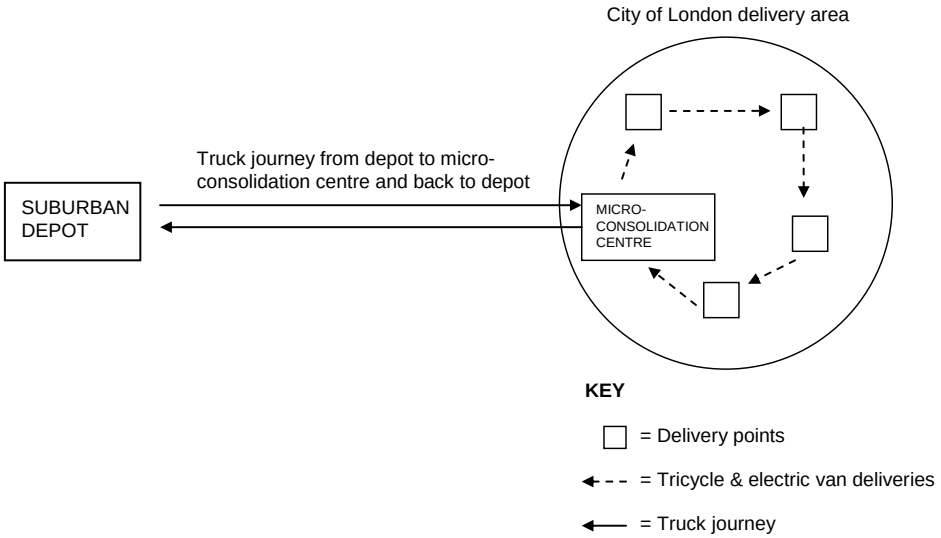
Source: University of Westminster survey 2009-2010

Note: CO_2e – carbon dioxide equivalent which includes carbon dioxide, nitrous oxides and methane.

The results in Table 1 show that by May 2010 the use of the micro-consolidation centre together with the complete replacement of the diesel van fleet by electric vans and tricycles led to a reduction of 20% in the total distance driven by all vehicles per parcel delivered between the suburban depot and the customer delivery locations. The total CO_2 equivalent (CO_2e) emissions per parcel delivered was 54% lower in May 2010 than in October 2009 before the trial. This was due to the reduction in the total distance travelled per parcel and the use of electric vehicles using fuel generated from renewable, carbon-free sources in the City of London.

3.5) Cost indication

Profitability was given 3 months after company started the new fleet

3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed?
3.7) Common practice before implementation	Following Figure describes the logistics system for deliveries by diesel vans from the suburban depot before the project starts. **Figure 1: Logistics system before the Cargocycle project start**  The next Figure shows the logistics system for deliveries by tricycles and electric vans via the micro-consolidation centre **Figure 2: Logistics system AFTER start** 
3.8) Motivation/ problem	Air quality, noise and image problems of the freight transport in central London.
3.9) Justification of practice	Because this company was the first to use this type of vehicles in UK

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Registration of the Cargocycles for road traffic.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The goods need to be of high density. The density of customers in a small area needs to be high. The town should not have big hills or steep terrain. The vehicle type has to be accepted for road usage by the country road authorities. The main barrier for a potential future client will be to change its usual, established customer and delivery relationships.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	Authorisation of the vehicle type for road usage
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	No barrier identified
4.5) Similar cases	French case of La Petite Reine. Bilbao. Other cycle freight projects and electric vehicle projects in Europe are used for retail deliveries.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Available data, high transferability, political implications
5.2) References	Michael Browne*, Julian Allen and Jacques Leonardi (2011): Evaluating the use of an urban consolidation centre and electric vehicles in central London. IATSS RESEARCH Vol. 35, No. 1 (Spring 2011) Special Feature on "Logistics Systems and the Environment"
5.3) Contact for further details	Jacques Leonardi j.leonardi@westminster.ac.uk Matthew Linnecar, Gnewt Cargo, London, http://gnewtcargo.co.uk/

5.4) Date of review	March 2013
5.5) Pictures	 Cargocycle  Small electric van

2.1.2 Electric vehicles use in parcels deliveries in Stuttgart-Ludwigsburg

1. Basic information	
1.1) Identification	Electric vehicles use in parcels deliveries in Stuttgart-Ludwigsburg Emission free urban delivery service by DPD in the Greater Stuttgart area using electric Mercedes-Benz Vito E-CELL transporters
1.2) Cluster	Cluster 1/ Urban Freight
1.3) Responsible authors	PTV, Claudia Eichhorn

2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transport industry, Research
2.3) Geographical Area	Field test with DPD: Stuttgart, Ludwigsburg, Wendlingen, Bietigheim-Bissingen Additional field tests with other transport operators: Munich, Hamburg, Rhein-Ruhr, Rhein-Main
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	The field experiment in Stuttgart is fully implemented and will be run as long-term test. Due to the success of the project, the practice has been transferred to further German regions. However, the Vito E-CELL transporters are not available for purchase yet.
2.5) Date of implementation	(09/2010: Start of the technical testing in Berlin) 01/2011: Delivery of the first 50 transporters to the testing partners in Stuttgart
2.6) Link to other clusters	No

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☐ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☒ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

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<tr><td colspan="2"></td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Transport operations in last mile parcel deliveries.</td></tr>
<tr><td rowspan="2">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
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☐ Increased amenity value
☐ Highest safety and security
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☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☒ Image
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☐ Others</td></tr>
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2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☐ Reduced congestions ☒ Reduced emissions ☒ Reduced climate change ☒ Reduced noise pollution ☐ Implementation degree ☐ High level of acceptance of solution/practice ☐ Other benefits:
2.12) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☒ Small scale trial under real business conditions, best practice under development ☐ Full developed best practice

3. Best practice	
3.1) Description of the practice	As part of the IKONE project, about 50 Mercedes-Benz Vito E-CELL transporters powered by electricity are used by selected partners in the Stuttgart region. Their field of application involves different kinds of commercial activities and delivery tasks. The Stuttgart region has got a very difficult topography (situated in a basin) and the filed test focused on the analysis of the vehicle use in these specific conditions. This practice helps reducing the CO_2-emissions in urban areas and thus involves an increase in the quality of live in the city. Furthermore, it contributes to the dissemination and public acceptance of electric vehicles in everyday traffic.
3.2) Technical main characteristics	Vehicles and charging - Maximum speed: 80 km/h - Driving range: 130 km - Admissible total weight: 3.050 kg - Maximum permitted load: 900 kg - Motor power: 60 kW - Front wheel drive - Recuperative braking system - Lithium ion accumulator - 400 V - charger connections installed by EnBW allow a maximum recharging time of 5 hours by night (0 – 100%) - Electricity consumption ca. 43 kWh per 100 km

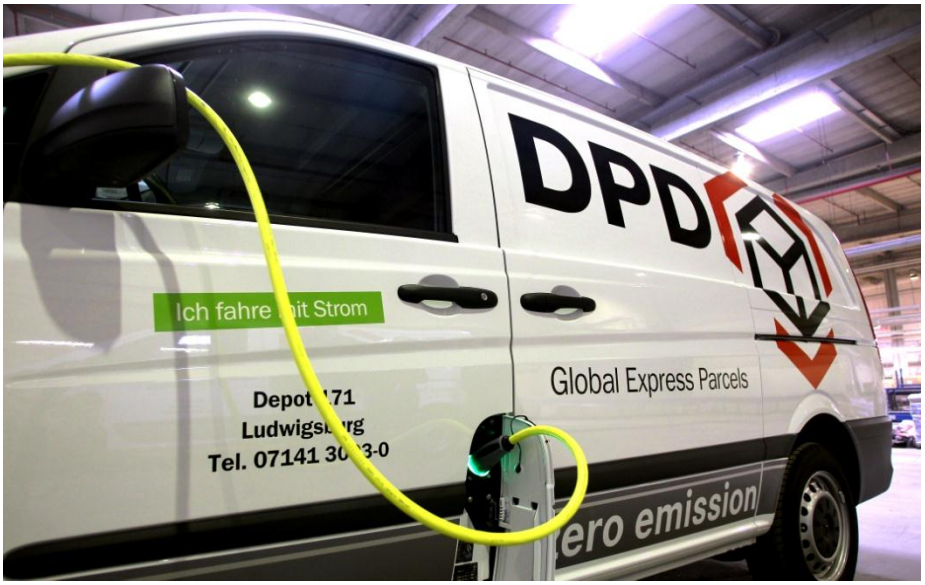
3.3) Success factors	- No emissions and no additional energy consumption at urban stop-and-go traffic. - The test in the very hilly area showed that the electric vehicle shows no disadvantages compared to conventional diesel vans concerning engine power. - The practice is optimal for planned delivery routes without too many changes. - Pleasant driveability for transporter drivers. - Electric vehicles are clearly usable in standard transport situations.
3.4) Main benefits	- Reduction of CO_2-emissions: about 103 kg per month and vehicle - Conservation of about 40 litres of fuel - Reduction of traffic noise - Increase of quality of live in urban areas
3.5) Cost indication	Full service leasing costs: 1.699€ (Vito E-CELL) compared to 600 - 900€ for a normal Mercedes-Benz Vito. (Costs that are due to shorter delivery tours are not known.) (Costs for the implementation of charging stations are not known.)
3.6) Barriers / Limitations	- A charging infrastructure and intelligent charging system had to be researched and implemented to assure charging of the vehicles. - Due to the restricted high speed (80 km/h) and driving range (130 km) the electric transporters do not fully replace conventional transporters. Therefore, most dispatcher designed specific delivery tours for the Vito E-CELLs - Due to the electronic car parts such as the accumulator, mechanics need a specific electrical engineering qualification in order to work on the Vito E-CELL (high voltage current) - In winter, the driving range decreases because of the heating. Since each additional electric consumer further reduces the driving range, the electric transporter does not contain air conditioning. - In Germany, distribution depots are more and more situated far away from the city centres which limits the use of electric vehicle due to their (today) limited driving range.
3.7) Common practice before implementation	Before, only conventional transporters were used.

3.8) Motivation/problem	- Minimisation of the impacts on the environment caused by delivery vehicles (the consumption of diesel at stop-and-go traffic is very high, electric vehicles show clear advantages) - Enforcing the implementation of electric vehicles in the sector of urban delivery and transports (urban freight transport as early adopter)
3.9) Justification of practice	The use of electric cars in normal urban delivery conditions and daily business is highly innovative and the results are well documented.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	The solution has also been implemented in the regions of Munich, Hamburg, Rhein-Ruhr and Rhein-Main.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The Vito E-CELL is usable for business internal and urban transports, big cities, Courier and Express Parcel Sevices, craftsmen in cities, city services and service companies.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	So far, the practice does not pay off financially compared to the conventional transportation system. However, it has been investigated to which extent specific political regulations affect the costs for users. It has been proved that the most effective measures are restrictions for conventional vehicles (e.g. restricted access, inner city toll). Unfortunately, it turned out that those (simple) measures which are most likely to be implemented are at the same time rather inefficient.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☐ Yes ☒ No
	As long as the driving range (130 km) and the maximum speed (80 km/h) of the delivery transporters are restricted, the solution cannot be used beyond urban areas and environs.

4.5) Similar cases	Are there existing similar cases? If so please indicate and specify what sets this case apart and makes it a better practice. Compare field experiments in the regions of Munich, Hamburg, Rhein-Ruhr and Rhein-Main.

5. Additional information	
5.1) Consid-eration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The case describes the general results of the IKONE project - test site DPD Stuttgart. This specific case is of high interest and should be investigated in more detail.
5.2) Ref-erences	http://www.mercedes-benz.de/content/germany/mpc/mpc_germany_website/de/home_mpc/van/home/vans_world/blueefficiency/technologies/e-cell.0002.html DPD article: 01 | 2011 - Emissionsfreie Paketzustellung: DPD präsentiert innovative Elektro-Fahrzeuge in Ludwigsburg (emission free parcel delivery: DPD presents innovative electric vehicles in Ludwigsburg) Final report IKONE project (Abschlussbericht Verbundprojekt IKONE) Final report EMKEP project (Abschlussbericht Verbundprojekt EMKEP)
5.3) Con-tact for further details	If personal contacts were established please provide the name, email and tele-phone number Peter Hirsch DPD GeoPost (Deutschland) GmbH Transportleitung Carl-Benz-Straße 17, 71634 Ludwigsburg Deutschland Tel. +49 (0) 71 41 30 03-500 Fax +49 (0) 71 41 30 03-9500 e-mail: peter.hirsch@depot171.dpd.de
5.4) Date of review	06/03/2013

5.5) Pictures	 

2.1.3 Distripolis in French cities

1. Basic information

1.1) Identification : Distripolis in French cities (a Geodis project)

1.2) Relevant cluster : CL1 City Logistics

1.3) Responsible review partner : Christophe Rizet –Ifsttar (no affiliation to the case)

2. Scope of practice

2.1) Approach . Private approach .

2.2) Actor classification

Main actor involved is Geodis (Messagerie express); Municipalities can also be involved but much less (Versailles, …)

2.3) Geographical Area

The Distripolis Best Practice started in Paris (France); it is currently also being developed in Versailles and in other French Cities (Lille, Strasbourg, Toulouse) ; it is planned in other European cities (contact with a municipality in Belgium)

2.4) Implementation

Status: The operations started in Paris with a platform (Bercy) a distribution center (Montparnasse) and electric vehicles but no distribution center is already fully in operation; for example the software for real time traffic GPS routing is still under development.

So the economic advantages can't yet be assessed.

2.5) Date of implementation : 2011

2.6) Link to other clusters : there are possible connections with CL3 (for real time traffic GPS routing) and possibly with CL2 (rail and waterways platform supply)

2.7) Topics covered

Infrastructure and Technology

. In Paris the main platform (Bercy) is accessible by train and waterway

. The main characteristic of Distripolis are the urban distributions centers located in the city center, coupled with low emission vehicles (electric vans and electrically assisted tricycles) and electric 'transpalets'

. IT-technologies and solutions (for management and administration)

. ICT (e.g. routing, guidance), transport optimisation : 2 softwares are used Geodrive (organizer of deliveries and picking) and Copilot (a GPS that should be real time traffic in the future)

Organisation and Cooperation

. In Distripolis, Business to business (B2B) is about 10% of deliveries and 20% of express deliveries for Geodis.

. Collaboration: Distripolis is a cooperation (mutualisation) of 3 subsidiaries of the Geodis Group

. Communication between businesses and authorities: Distripolis is searching for an agreement with cities (Strasbourg, Versailles) to search for a good Distribution center location and for clear traffic regulations.

. Business models: (All vehicles are rented but this is general for Geodis)

Operations and Services

. Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) : about 90% of deliveries

. Innovative operational solutions : Coupling City distribution centers with electric vehicles on a large scale.

. Service quality and sustainability agreements/certification : Certification is a general rule for Geodis, not only for Distripolis

. Transport management, fleet management : yes

Regulations and Policy : regulations such as constraints on emissions are very important characteristics of the context, that will facilitate or bother the success and possible development of Distripolis

. Land use and spatial planning: assessment and siting of transport facilities and infrastructure: A good location for urban distribution centers is another important condition for the implantation of Distripolis

. Training for EV drivers (to rise the vehicle autonomy)

2.8) Transport modes

Transport modes/vehicle types affected by the solution : electric trucks and vans and electrically assisted tricycles. In the future (after massification) rail and inland waterway vessels.

2.9) Supply chain elements

Other elements of the supply chain are involved in the practice : city distribution centers and electric transpalets, software.

2.10) Targets supported by the implementation (private actors) :

- . Increased efficiency / productivity of logistics processes
- . Increased competitiveness
- . Increased quality
- . Image
- . Increased safety and security
- . Limited climate change
- . Reduced emissions
- . Conservation of resources (fossil energy)

2.11) End-user benefits

End-users benefit mainly in

- . Quality of services
- . Reduced congestions
- . Reduced emissions
- . Reduced climate change
- . Reduced noise pollution
- . Level of acceptance of solution/practice is difficult to assess: the end user generally does not know that he is serviced via Distripolis.
- . Other benefits: mainly image and help in reaching its sustainable development targets.

2.12) Level within innovation cycle

- Full developed best practice

3. Best practice

3.1) Description of the practice

Distripolis promotes an approach to last mile logistics that is more respectful of the environment. Launch in Paris – the first phase of Distripolis rollout – is organised as follows:

- grouped shipment of goods to a platform (Bercy); 3 networks are merged (3 subsidiaries of Geodis : Geodis Calberson, France Express et Geodis Ciblex)

- goods divided in the long-term among eight environmental urban logistics bases (“BLUE” bases) located close to major retail areas in Paris,

- the delivery of small parcels and pallets up to 200 kg from BLUE bases via ecological vehicles, namely power-assisted tricycles and electric vans,

- deliveries of over 200 kg will be done with Euro 5-compliant trucks and, in the long-term, Euro 6-compliant or hybrid trucks.

3.2) Main technical characteristics

The Electron is a safe and clean vehicle jointly developed by Fraikin and Fiat especially for urban deliveries. The comfortable and reliable Electron makes the driver’s everyday job easier and boosts productivity. The lightweight frame is capable of transporting loads of up to 1 tonne, instead of the 750 kg carried by traditional 20m3 vehicles.

Main features:

Gross vehicle weight: 3,500 kg – Payload: 1,000 kg

Motor: asynchronous electric

Range: 105 to 155 kilometres

Top speed: 90 km/h

Charging time: 6 to 8 hours

Direct access to the back from the cab

Access ramp for pallets

Right-hand side door

Work table and PDA holder

Folding shelf for small parcels

Anti-theft straps and pallet truck mounting

Power-assisted tricycles

These electrically assisted tricycles are designed to make city centre deliveries. They can be used to deliver small parcels in the city centre, while limiting the disturbances usually caused by traffic. They can use cycle paths and access semi-pedestrian precincts that are not covered by the restrictions applying to the times when vehicles are admitted into the city centre.

Main features:

Payload 180 kg – 1.5m3

Average speed of 20 km/h

Range: 50 kilometres

Gradients of up to 8%

Powered by an 8Ah – 24V ion-lithium battery

Comfortable, adjustable seat with lumbar support

Water tight, secure box on the rear.

3.3) Success factors : Distripolis is only starting and its financial success has not yet been fully assessed. It will depend a lot on the evolution of environmental regulations concerning urban freight.

3.4) The main targeted benefits of Distripolis are environmental and for society (congestion). Financial benefits are still unknown. The services should be equivalent.

3.5) Barriers / Limitations

Three important difficulties or limitation :

To find good place(s) in the city center for transshipment is a limitation for the implementation in many cities.

The information system mutualization between the 3 subsidiaries of Geodis was not so easy.

The tricycle drivers required new qualifications and new manpower management.

3.6) Common practice

Before implementation in Paris the parcels and pallets were delivered separately by the 3 subsidiaries : 3 networks with one platform and with ‘normal (ICE) vans and trucks.

3.7) Motivation/problem

The main motivation that led to the development of Distripolis was to anticipate the environmental constraints that should arrive on urban freight. This is also the main risk, if the constraints don't appear or appear too late.

4. Transferability

4.1) Geographical area

Distripolis is planned to be transferred to other towns, in France (Lille, Strasbourg, Toulouse) and in Europe (contacts in Belgium).

The main requirements for the implementation in another city are the city distribution centers (find a suitable place) the volume of demand and the (future) regulation of urban freight.

4.2) Usability in other domains

To transfer he Distripolis concept to other actors or industries, an important volume of freight demand is necessary.

4.3) Framework conditions and regulations

The more constraints on freight traffic, such as Low Emissions Zones, the best for Distripolis success.

4.3) Extensibility The target of Distripolis are the cities; It is not intended for the countryside or small towns where the density of the demand is too low to pay off the overcost of electric vehicles.

4.4) Are there existing similar cases?

There are several cases of city distribution centers coupled with electric delivery vehicles. The specificity of Distripolis is its scale and the fact that the whole process is optimized to reduce CO2.

4.5) Political framework conditions

The concept is based on the idea that more and more environmental constraints will be put on transport, and mainly on urban transport : the more constraints on pollution, GHG emissions and congestion, the best for Distripolis.

5. Additional information

5.1) Consideration for in-depth

We (Bestfact) should wait before starting an in-depth review of Distripolis : in one year, there will be more to consider and analyse for financial results and the city of Versailles will probably be totally implemented.

5.2) References : :
http://www.geodis.com/file/dossierpresse/pj/bb/9e/ed/bd/dp_distripolis%201182841956863346025.pdf

5.3) Contact for further details :

Julien GOUVIS
GEODIS Calberson - Division Messagerie/Express
Cap West - 7/9 Allées de l'Europe 92615 Clichy
Tel : + 33 1 56 76 27 31
e-mail : julien.gouvis@geodis.com

5.4) Date of review : 02/10/2012

5.5) Pictures

2.1.4 Cityporto Padova

1. Basic information	
1.1) Identification	Cityporto Padova
1.2) Cluster	Cluster 1 - Organisation and Cooperation (PPP)
1.3) Responsible authors/	Carlo Vaghi, Gruppo CLAS Thanks to the contribution and input of Interporto Padova SpA, Mr Paolo Pandolfo

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private approach
2.2) Actor classification	Freight village and intermodal terminal manager (Interporto Padova SpA) Public administration (City of Padova, Province of Padova) Chamber of Commerce of Padova
2.3) Geographical Area	Padova, Italy
2.4) Implementation status	To what extent is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	Cityporto is the goods distribution service in the City of Padova, managed by Interporto Padova, in operation since 2004. Deliveries for the inner city centre of Padua (830.000 sq.m.) are performed through a Urban Distribution Center (at the Interporto), where goods are sorted by destination and delivered by low emission vehicles (CNG).
2.5) Date of implementation	April 21st, 2004
2.6) Link to other clusters	Cluster 2: The success of Cityporto service makes it ready to develop new ICT and organisational solutions to ensure the delivery of perishable goods (already experimented), express courier parcels, and connect the service with rail freight transport (available at the Interporto).

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☒ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☒ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☒ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☒ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☒ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td>Cityporto service is provided by 10 CNG-powered vehicles.</td></tr>
<tr><td>2.9) Supply chain elements</td><td>What other elements of the supply chain are involved in the practice?
The main supply chain elements covered are:
• Warehousing (cross-docking)
• Last-mile transport and delivery</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☒ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☒ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☒ Increased quality
☒ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☒ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☒ REDUCED CONGESTION DUE TO THE CONSOLIDATION OF GOODS</td></tr>
<tr><td colspan="2">Please specify all other and different targets here…</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☒ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☒ Reduced congestions ☒ Reduced emissions ☒ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…
2.12) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

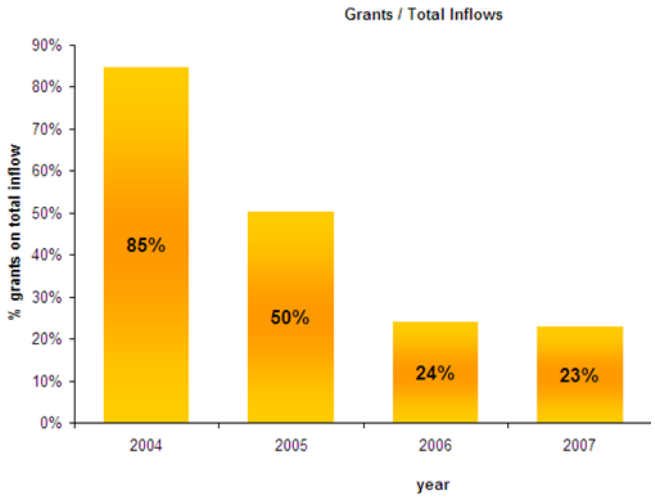
3. Best practice	
3.1) Description of the practice	"Cityporto-consegne in città" is a urban distribution service operational in the urban area of Padua, focusing on the local LTZ, having a size of 830000 sq.m.. The manager is Interporto Padova S.p.A., which also manages the local freight village, a PPP whose major Stakeholders are the local public bodies (Municipality, Province, Chamber of Commerce). The service is operating since 2004. After the successfully overcome start-up phase, Cityporto now performs 95.000 deliveries per year (2011), for 60 customers (the major part of couriers and forwarders operating in the city, but also SMEs that usually delivery its produce on own account). The service was granted in the start-up phase (2004-2007) by the City and the Province of Padua, and the local Chamber of Commerce, as stated in a Framework Agreement, which itself is a best example of concertation among stakeholders involved in city logistics issues. Cityporto wants to develop its range of services, in order to address markets which are usually unexploited by city logistics services, and to exploit the opportunities given by the integration of the UDC in the framework of the intermodal terminal and its IT management systems.
3.2) Technical main characteristics	The deliveries are performed by 11 LNG-powered vans; two of them are equipped for the delivery of temperature-controlled goods. The UDC is a 1000 sq.m. wide cross-docking platform located within the freight village

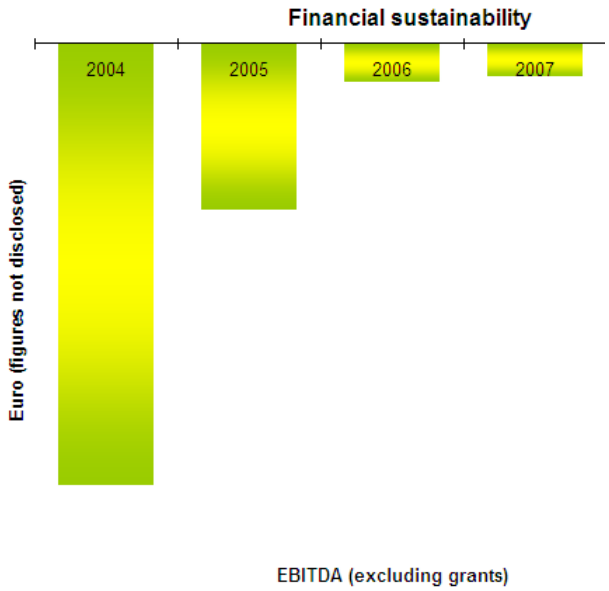
3.3) Success factors	Cityporto is undoubtedly the most relevant and successful city logistics system in Italy, recognised as one of the European best practices. It shows some peculiar success factors, such as the location of the UDC within the freight village, operating since decades, renowned among operators, near their logistic platforms and sufficiently far from shops of the inner city. The model is nowadays replicated in other medium-sized Italian cities (Modena, Aosta, Brescia). Other success factors are: • The neutral role of Interporto Padova as UDC manager • The development of a dedicated IT System for Cityporto services

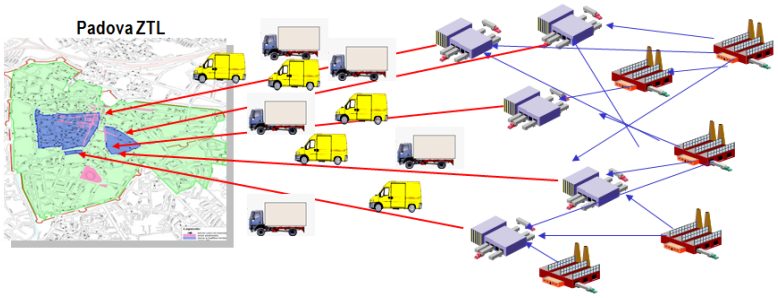
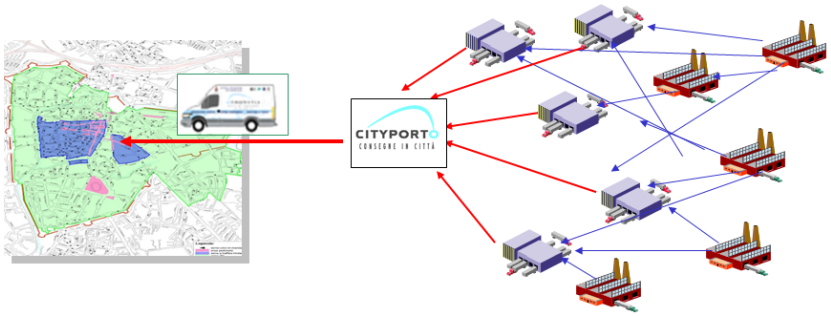
3.4) Main benefits	The introduction of a public-private urban logistics scheme based on the cross-docking and consolidation of freight in a UCC brings benefits both in terms of increased transport efficiency and of reduction of polluting emissions. A recent research made by Gruppo CLAS on behalf of Interporto di Padova assessed both categories of benefits. The survey focussed on a 24 months long operational period (485 operational days), from July 2008 to June 2010. In the period 122,170 deliveries were performed by the 10 operational CNG-powered Cityporto vans. The vehicles performed 6306 delivery trips in total. For all of them, complete data registered by tracking & tracing IT system were available. The benefits were assessed by a complex calculation, aimed at comparing: • The number of delivery trips performed *ex ante* by Cityporto customer (data estimated from interviews), their average distance and the vehicles used (by Euro-category); • The number of delivery trips performed by CNG-powered Cityporto vehicles, their actual distance covered and their emissions standards. The following main results were assessed from the survey (all results are referred to the 2-year timeframe July 2008-June 2010): • The introduction of Cityporto service led to a decrease of total distance covered by CItyporto customers' vehicles, by 727,920 km. Considering the distance covered by Cityporto vehicles (166,478 km) the total distance saved is estimated **561,442 km.** • The net reduction of polluting emissions, by pollutant, is the following: • CO_2: 219.65 tonnes • NOx: 369 Kg • SOx: 72,8 Kg • VOC: 210,4 Kg • PM10: 51,4 Kg. The Cost-Benefit Analysis made within the assessment of benefits led to a NPV-E of 273,000 €, extended to a 5-year timeframe (2008-2013), which leads to a B/C ratio of 2,94[2].

[2] Where the "cost" is the grant provided by the Ministry of Environment in the 2-year timeframe surveyed for the purchase of 2 CNG-powered vehicles.

3.5) Cost indication	Costs of Cityporto service are undisclosed. However, the amount of public grants provided to Interporto di Padova (a public in-house company itself) for the service start-up is available. The City and the Province of Padova, Veneto Region and the Chamber of Commerce of Padova provided a total grant of 360,000 € in a 4-year timeframe (2004-2007). The intensity of the grants decreased year by year. An additional "grant", as it is considered by Interporto di Padova, is the cost-opportunity of the platform rent (i.e. Cityporto UCC would be rented to third parties if Cityporto didn't exist). The financial self-sustainability of Cityporto has been achieved at the end of 2007, facing the end of public granting after 2007. The following figures show the intensity of grant on total inflows and the financial sustainability of Cityporto service during the start-up period. **Figure 3: Financial sustainability of the Cityporto Padova case**





3.6) Barriers / Limitations	The adoption of Cityporto service, following a Framework Agreement with interested city stakeholders, has so far proven its effectiveness in reducing congestion, energy consumption and pollution deriving from freight traffic in Padua urban area. The main barrier to overcome before the service implementation was the attractiveness of the service. It was ensured by implementing a specific regulation for access and loading/unloading in Padova city centre. From 2004 on, Cityporto vans can enter the dedicated lanes used by buses and taxis, and (differently from the common freight vans) they have no time windows for loading/unloading in the ZTL (Limited Traffic Zone). Barriers still exist in attracting to such cooperative and efficient city logistics service more time-sensitive goods such as parcel (usually delivered by express couriers), and perishable goods. Both logistic segments need a time-definite delivery which is often not compatible with the additional cross-docking operation needed in the UDC.
3.7) Common practice before implementation	The common practice for delivering goods in Padova city centre, compared to the new one allowed by the implementation of Cityporto, is represented by the following figures, which show a common ex-ante of goods delivery vs. ex-post practice after the implementation of a UCC-based model. **Figure 4: Ex-ante and Ex-post systems of the Interporto logistics** *Ex-ante situation*  *Ex-post situation* 

3.8) Motivation/problem	The introduction of Cityporto service was motivated for limiting the traffic congestion and pollution of Padova city centre, led, at least in a small part, by the freight traffic. The specific congestion made by the presence of many delivering vans in the narrow streets of the city centre is limited by the presence of Cityporto vans, that run with a much higher loading factor.
3.9) Justification of practice	Cityporto can be considered as a best practice since: • It is innovative beyond the common practice of goods delivering in medium-sized cities; • It has proven feasible and financially self-sustainable after a medium-long period (8 years since its implementation) • It proved considerable and measurable positive effects on traffic congestion and pollution (see 3.4) • It has proven as a transferable practice (see 4.1)

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	See 4.5
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The use of a UCC is a transferable practice to any other logistic case faced with the need of consolidating goods.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	See 3.6
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No

	Cityporto has proven to be a replicable practice throughout several Italian medium-sized cities. Moreover, Cityporto has issued a development plan aimed at reaching 160.000 deliveries per year in 2014. The goal is to improve Cityporto, in operation within a urban freight terminal, with additional and innovative features in order to attract to a sustainable city logistics service more freight, delivered by more environment friendly vehicles. Selected actions are: • Integration of parcel delivery in Cityporto range of services, through selected agreements with express couriers. • Integration of perishable goods in Cityporto range of services • Extension of delivery services to non-urban areas • Adoption of a new tracking and tracing system for urban deliveries • Renewal of Cityporto fleet with hybrid vehicles • Revamping of the current Framework Agreement between the city logistics manager and the City of Padova, and fine tuning of current regulatory fostering policies • Integration of Cityporto with the rail-road transhipment activity currently performed in Padua intermodal terminal. In particular, integration with the new ICT terminal management system, to be installed in 2013.
4.5) Similar cases	Cityporto model has been replicated in other Italian cities, where the local City Administrations implemented (or attempted to implement) similar city logistics schemes, even assisted by Interporto di Padova in the design phase. Those cities are: • Aosta: Cityporto Aosta is running since 2011 • Modena: Cityporto Modena is running since 2007 • Como: Merci in Centro Como is operational since 2009 • Brescia: Ecologistic Brescia is operational since 2012. However, although operational, those "replicated" models have not reached the volume of deliveries performed by Cityporto Padova yet.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	All considerations made in 4. give motivation for issuing a in-depth analysis.
5.2) References	The latest presentations and data on Cityporto are available at www.cityporto.it

5.3) Contact for further details	Mr Paolo Pandolfo - CEO of Interporto Padova pandolfo@interportopd.it
5.4) Date of review	30/11/2012
5.5) Pictures	 

2.1.5 Cargohopper, Utrecht, Netherlands

1. Basic information	
1.1) Identification	Cargohopper, Utrecht, Netherlands
1.2) Cluster	Cluster 1, urban freight
1.3) Responsible authors/	Konstantina Laparidou (Panteia)

2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Solution implemented by Hoek Transport Other actors: municipality of Utrecht End-users: The Cargohopper works for shops, companies and for the citizens of Utrecht
2.3) Geographical Area	Region of Utrecht, the Netherlands
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
2.5) Date of implementation	2009
2.6) Link to other clusters	Urban freight (Cluster 1)

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☐ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☒ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td></td><td>Text…</td></tr>
<tr><td>2.9) Supply chain elements</td><td>Suppliers (distribution centres), end-users</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others

For private actors:
☒ Increased efficiency / productivity of logistics processes
☒ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☐ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td></td><td>For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td></td><td>The Cargohopper can also be used as a ‘public announcer’, because there is space on the sides of the vehicle for advertisement …</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☐ Reduced congestions ☒ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☐ High level of acceptance of solution/practice ☐ Other benefits: (increased safety, attractive city centre)…
2.12) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

3. Best practice	
3.1) Description of the practice	The Cargohopper is a multi trailer, 16-metre long yet narrow, solar powered road train riding on pneumatic tires. The Cargohopper is used to deliver parcels in Utrecht's inner city quarters. It is designed for the delivery of packages (not for pallets). The three containers are in fact separate boxes that can be loaded on and off the undercarriages by a forklift. Eight of those boxes fit on a European sized trailer of 13.60 meters.
3.2) Technical main characteristics	The Cargohopper is a vehicle that is able to tow 3 metric tons in a line (16 meters) with a 48 Volt 28 hp electric engine. Its maximum speed is 20 km per hour, but that is more than enough as it is only driving in the inner city of Utrecht and does not make more mileage than a maximum of 60 kilometres per day. The Cargohopper can also collect dry cardboard, paper and empty packaging from shops for recycling, so it never has to run empty. The Cargohopper is able to make 3 complete round trips a day, which means that it can do the work of 5 to 8 regular (European sized) delivery vans (e.g. Mercedes-Benz Sprinter). The Cargohopper has zero emission (3 solar panels on top of the lorries) and is allowed in the inner city at any time and any place. That is part of the advantage. It is also quite narrow: only 1.25 meters wide so when it stops to make a delivery in narrow streets, most of the other traffic is able to pass.
3.3) Success factors	This measure shows that sustainable transport (less vkm, energy consumption, emissions) can be done in a profitable way, without financial support from the community

3.4) Main benefits	Energy efficient, sustainable solution (in terms of emissions but also costs)
3.5) Cost indication	The initial investment to get the Cargohopper on the road exceeded the originally estimated amount of 150.000 euro's by at least 20%.
3.6) Barriers / Limitations	One of the disadvantages of the Cargohopper is the limited range and the low speed. The Hoek City Distribution Centre is about 11 km outside the inner city limits. This is why an extra transfer point was created.
3.7) Common practice before implementation	Use of conventional trucks/ vans for last mile operation
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice?
3.9) Justification of practice	Cost-efficient, easily transferable without governmental support

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	Technical limitations of the vehicle
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
4.5) Similar cases	

5. Additional information	
5.1) Considera-tion for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
5.2) References	TURBLOG report
5.3) Contact for further details	
5.4) Date of re-view	06/03/2013
5.5) Pictures	 Source: the TURBLOG report

2.1.6 Binnenstadservice Nederland

1. Basic information	
1.1) Identification	Binnenstadservice Nederland
1.2) Cluster	Urban freight
1.3) Responsible authors/	Partner filling this format (also specify possible affiliation to the case), if external partners supplied information please specify. Mobycon

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	*Which branches of industry, which type of authority or what other type of actor groups are involved? Name all possible.* - freight transporters - retailers - shopkeepers - local authorities
2.3) Geographical Area	*From which country (and city) does the practice originate?* Nijmegen, Netherlands
2.4) Implementation status	*To what extend is the solution implemented / in operation? Please indicate and explain.* ☒ fully ☐ partly ☐ planned
	Binnenstadservice Nederland (BSN) started in Nijmegen. At this time, after 4 years, about 14 other cities are working with the Binnenstadservice concept.
2.5) Date of implementation	*What year (or more specific date if possible) was the new solution implemented?* April 16, 2008
2.6) Link to other clusters	• *Are there existing connections to another cluster topic?* • *Can there be future links to other cluster topics?* Urban Freight, Green Logistics and Co-modality

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☒ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☒ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☒ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☒ Business to business (B2B) solutions, cooperation ☒ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☒ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☒ Business models: new form of ownership, risk management ***Operations and Services*** ☒ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☒ Innovative operational solutions ☒ Value added services, development (or extension) of services ☒ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☒ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☒ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☒ Education and training ☒ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
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☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td></td><td>Text…</td></tr>
<tr><td>2.9) Supply chain elements</td><td>What other elements of the supply chain are involved in the practice?
- storage
- handling
- unloading / loading
- warehousing
- transhipment</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☒ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☒ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☒ Others, i.e more attractive inner city

For private actors:
☒ Increased efficiency / productivity of logistics processes
☒ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☒ Increased quality
☒ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td></td><td>For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☒ Others? Please specify: reduced congestion</td></tr>
<tr><td></td><td>Please specify all other and different targets here…</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☒ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☒ Quality of services ☒ Reduced congestions ☒ Reduced emissions ☒ Reduced climate change ☒ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☒ Other benefits: (please specify): more attractive inner city
2.12) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

3. Best practice	
3.1) Description of the practice	*Please provide a description of the solution, give details about the **purpose** and the **sustainability objectives**.* Binnenstadservice Nederland is an innovative concept already applied now for four years in approximately 14 cities in the Netherlands. Binnenstadservice operates a warehouse and distribution service on behalf of the joint retailers and other organizations located in the (inner) city. It started in Nijmegen and now covers: Arnhem, Nijmegen, Den Bosch, Amsterdam, Arnhem, Beuningen, Dordrecht, Gouda, Heerlen Maastricht, Nieuwegein, Rotterdam, Tilburg, Utrecht and Wijchen. Basic approach is that goods are delivered at a distribution centre just outside the city. From there the goods are bundled and brought to shops in the city centre. Simultaneously empties-/emballage/paper is taken back to the distribution centre. Binnenstadservice does not operate their own vehicles, but this is subcontracted to one logistics service provider per city. Through the efficient logistic solution the city centre gets cleaner and more livable. Binnenstadservice uses clean, green vehicles, including a truck on gas and transport by e-bike. Also by reducing the number of vehicle movements in and out of the city center it improves the environment for habitants and customers.
3.2) Technical main characteristics	*What are the technical main characteristics?* See above

3.3) Success factors	*What are the main success factors of the practice? Why does it work so well?* Because of the collective receiving and shipping of goods Binnenstadservice is very efficient. This is to the benefit of all involved parties: For shopkeepers: a shopkeeper does not has to sign multiple times for a package that is delivered, but get it all in one load. For transport companies: they can deliver the goods at the distribution centre on the outskirts of the city. They thus don't have to enter the city themselves, which could save them time/money. It also eases the pressure of time windows and environmental zones. For shippers: ultimately they will pay less for the transport of the goods, since the 'last mile' becomes cheaper For the city: it reduces environmental pollution and makes the city more liveable due to less trucks and more environmental friendly trucks/delivery vans.
3.4) Main benefits	*What are the main benefits of the practice?* The main benefits of Binnenstadservice are: Financial benefits: - Shop keeper: reduced stock at expensive shop floor, reduced time needed to receive/ship goods - Transport company/shipper: reduced time loss for last mile delivery, thus cost reduction Benefits in the field of services: - Shop keeper: pays a little fee for time consuming activities such as packaging, empties, paper Benefits for society: - Less congestion, more liveable city centre. Environmental benefits: - Reduced CO2 and particle emission due to bundling of freight and cleaner vehicles. It is not possible to quantify these benefits, since they will be specific for each city. Model calculations however show a 9% decrease of transport costs and a 41% reduction of CO2 emission (assuming 100% participation of all small shipments).

3.5) Cost indication	*If available, give indication of costs* The business model is based on the fact that the shopkeepers don't pay for the delivery of the goods. They however have to pay for the additional services (emballage, empties, paper). It is the transport company that used to deliver the freight to the inner city customers that now has to pay a fee to Binnenstadservice. Then Binnenstadservice bundles the freight and contracts it out to one logistics service provider per city.
3.6) Barriers / Limitations	*What were the main barriers and limitations to overcome for the implementation? And how was it managed?* Binnenstadservice needs a lot of retailers to join to create the critical mass to make it successful. In many cities Binnenstadservice starts with a subsidy to create some time to convince the shopkeepers to participate. In addition it would be helpful if shippers require from their logistics service providers to deliver the goods to the Binnenstadservice depot, and not to the inner city shopkeepers.
3.7) Common practice before implementation	*Please specify what the common practice was before the implementation.* Before Binnenstadservice retailers got several deliveries on a day. Also, transport companies had to deal with time windows for delivery and/or restrictions with respect to environmental zones.
3.8) Motivation/problem	*What was the main problem or motivation that led to the development and introduction of the new practice?* Environmental concern and nuisance of trucks and delivery vans in the city centre. In general freight deliveries are conflicting with liveable cities.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? After four years of the launch of Binnenstadservice in Nijmegen it has rolled out in 13 other cities in the Netherlands. And it can be transferred to other cities across Europe.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)? There are no special requirements for it to transfer.

4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☐ Yes ☒ No
	Please give a reason for your evaluation
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	Please give a reason for your evaluation: The Binnenstadservice concept is on a voluntary basis. However, some conditions could facilitate the introduction, for example strict time windows, limited loading/unloading facilities and strict environmental conditions (environmental zones), since it will 'force' transport companies to look for cheaper/more easy solutions.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	Please give a reason for your evaluation The more cities participate in the Binnenstadservice concept, the easier it is for shippers or transport companies to make use of the concept, because it becomes a common practice. In the current situation, where Binnenstadservice does not cover all cities, shippers and transport companies have to deal with different situations and conditions in different cities.
4.5) Similar cases	*Are there existing similar cases? If so please indicate and specify what sets this case apart and makes it a better practice.* CityDepot België, Citylogistik Denemark

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Please give reasons why this case should be (or should not be) considered for in-depth review Successful concept proven by it's roll out in 13 other cities. The concept is continuously improving, so even if it has already been described in previous projects (BESTUFS, PROMIT), it would be worthwhile to continue monitoring it.

5.2) References	References and sources used to provide the given information www.binnenstadservice.nl/ http://www.tno.nl/content.cfm?context=thema&content=prop_publicatie&laag1=894&laag2=913&laag3=102&item_id=598
5.3) Contact for further details	If personal contacts were established please provide the name, email and telephone number Birgit Hendriks, e-mail: birgit.hendriks@eco2city.nl
5.4) Date of review	Latest date of update of this format (06/03/2013)
5.5) Pictures	Please link, attach or insert pictures, pictograms etc. that show the main idea of the case (for broad publication)  

2.1.7 Berlin tests of BentoBox in the Laboratory area for urban logistics innovations

1. Basic information	
1.1) Identification	Laboratory Area: the BentoBox example
1.2) Cluster	Cluster 1, Knowledge, Tools and Methods
1.3) Responsible authors/	Gabriela Barrera, Polis.
2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	Which branches of industry, which type of authority or what other type of actor –Local administration: Senate department for Urban development and Environment, Berlin The BentoBox testing also included: -Fraunhofer-Institute for Production Systems and Design Technology (IPK) -Logistic Network Consultants -Courier service operator: Messenger Transport -Engineering, construction and manufacturing company: Constin
2.3) Geographical Area	From which country (and city) does the practice originate? Germany, Berlin
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	The 'laboratory area' is a defined area in the city which enables to develop, test, study and present new technical and social solutions/practices. It was first implemented within the CityLog EU Project (www.city-log.eu) to test the BentoBox solution (flexible pack station). The Senate Department for Urban Development and Environment seeks to use this area for further test, including e-mobility and smart freight solutions.
2.5) Date of implementation	The 'laboratory area' was set early 2011. A diary of deliveries was carried out during one week. The BentoBox test started in November of the same year and was finalised in January 2012.

2.6) Link to other clusters	The ‘laboratory area’ could be used to test a wide range of solutions also linked to CL2 and CL3.

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☐ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☒ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☒ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☒ Road/ motorcycles, scooter etc.
☒ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☒ Others: please explain …</td></tr>
<tr><td>Others: E-bikes and E-vehicles.
Within the BentoBox test the following bikes/vehicles were tested:
-Cargo (e)-bikes which can transport up to 70 kg
-Cruiser bikes transporting up to 250 kg in the dimension of EURO pallets. They can have a 80 km range.</td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">What other elements of the supply chain are involved in the practice? (e.g. terminals, warehouses, transhipment platforms etc.) Compare the figure below (source Cofret D2.1) for reference (can be deleted after filling the format).
Different kind of solutions can be tested in the ‘laboratory area’ involving different elements of the supply chain. In the BentoBox test these will include transport, unloading/loading, storage.</td></tr>
<tr><td rowspan="2">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☒ Efficient public spending
☒ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☒ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☐ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☒ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
☐ Reduced emissions
☐ Conservation of resources
☒ Others</td></tr>
</table>

	Others: The above indicated targets just refer to the 'laboratory area' itself and not to the solutions tested. One of the main targets for both actors will relate to the efficient use of resources and existing data. In the case of the BentoBox solutions, the following targets will apply: -Public actors: ideal utilisation of infrastructure, balanced provision of goods and services -Private actors: increased competitiveness, increased quality, increased safety and security, image -Both actor groups: reduced emissions
2.11) End-user benefits	How do end-users benefit? ☒ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☐ Reduced congestions ☐ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☒ Other benefits: less costs and work for data collection and evaluation when testing different solutions. The above indicated benefits just refer to the 'laboratory area' itself and not to the solutions tested. In the case of the BentoBox solutions, the following end-user benefits could apply: quality of services, reduced congestions/emissions, reduced noise pollution, high level of acceptance of solutions/practice.
2.12) Level within innovation cycle	☒ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☐ Full developed best practice

3. Best practice

3.1) Description of the practice	The 'Laboratory area' is a defined area in the City which enables to develop, test, study and present new technical and social solutions/practices. **Advantages of a Laboratory area** • Visibility of developments through local concentration • Increasing efficiency and time savings by - Sharing and using contact networks and local knowledge - Joint collection and usage of basic data (socio-economic structure data, traffic data, environmental data) → required for suitable impact analyses as well as scenarios.
3.2) Technical main characteristics	What are the technical main characteristics? • well definable area with clear borders • high density and diversity of traffic and space utilization • spatial competition of different usages, distinct potential for conflicts • high potential for reduction by using innovative transport concepts and vehicle solutions. • Regular update of data 'Steglitz/Friedenaus' was selected as the 'laboratory area'. A first diary of deliveries was carried out during one week in the spring of 2011. 106 retail and catering companies were contacted, having 65% of response (69 diaries). The collected information included -time and duration of each delivery -name of the supplier -type of delivery -vehicle class Further steps in the collection of delivery data include large shopping centers, comparing these with retail enterprises. An evaluation of the amount of time for critical supplies is also foreseen. In particular for the BentoBox, this was used as a consolidation point for inner-city distribution where shipments were bundled. The Constin company provided the space for its installation. Collection and distribution shipments in the test area were done by cargo bikes courier (the BentoBox had been integrated in the regular logistics services by Messenger Transport). Three scenarios were tested: -The BentoBox was used as a collection and distribution point -Overnight service -BentoBox was used to lodge parcels for Constin, the company on whose backyard the BentoBow was placed

3.3) Success factors	What are the main success factors of the practice? Why does it work so well? –Reduction of data collection/monitoring costs and time savings -Visibility of solution tested -Sharing data, contacs, using local knowledge -Political will and need to act For the BentoBox: flexibility of the system
3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • Efficient public spending • Ideal utilisaiton of infrastructure • Acceptance and influence In particular for the BentoBox test it has been estimated that 85% of the conventional light commercial vehicles' routes could be relaced by cargo bikes.
3.5) Cost indication	If available, give indication of costs
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed?
3.7) Common practice before implementation	Please specify what the common practice was before the implementation. Before the implementation of the 'laboratory area', different parts of the city were used for pilots; the previous testing areas were selected based on the requirements of the solution to be evaluated. For the BentoBox: The Messenger courier service has a diverse vehicle fleet, including bikes, cargo bikes and light commercial vehicles. Before the BentoBox pilot deliveries were made directly to different customers. The tested solution was used as a consolidation hub or decentralised stock for collecting and delivering the shipments from and to customers. Drivers had a personal access to the BentoBox. This new stop enabled the drivers to extend their range when using (e)bikes, reducing in this way the kilometres driven by conventional cars.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice? Data collection involves a high workload and costs. The 'laboratory area' was set to reduce these and to concentrate and provide visibility to the different solutions evaluated. For BentoBox: consolidating shipments, reducing kilometres driven by conventional cars.

3.9) Justification of practice	Why can this case be considered a Best Practice ? The 'laboratory area' is a project lead by a local authority which answers the evaluation issues commonly encountered when setting urban freight pilots. It is efficient, low cost and easily transferable. For the BentoBox it addresses business and policy objectives, transferable and feasible solution.

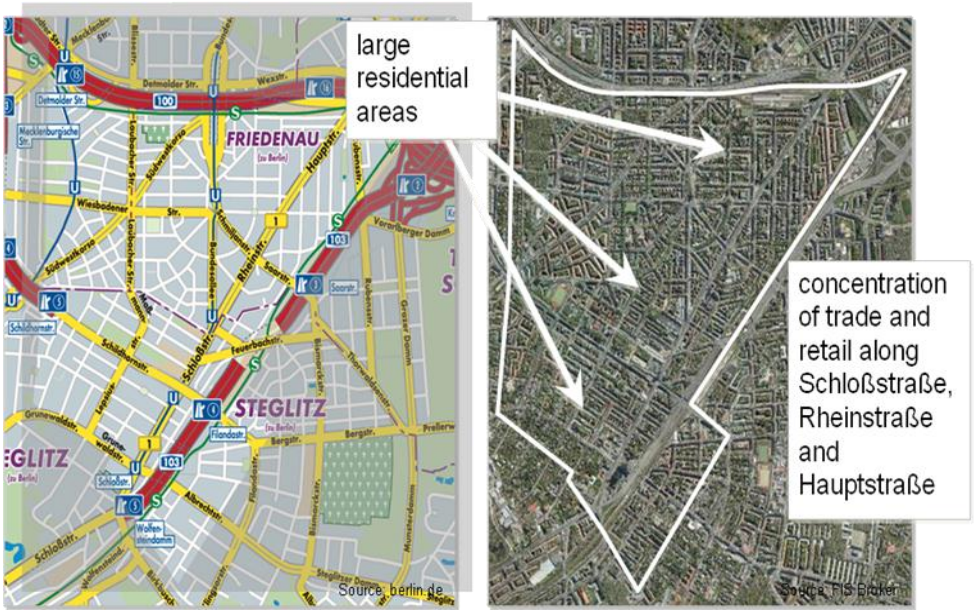
4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)?
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Please give a reason for your evaluation: time effective general methodology
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	Please give a reason for your evaluation
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	Please give a reason for your evaluation
4.5) Similar cases	Are there existing similar cases? If so please indicate and specify what sets this case apart and makes it a better practice.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Please give reasons why this case should be (or should not be) considered for in-depth review: Nature of the Best Practice

5.2) References	References and sources used to provide the given information Menge.J. 'laboratory area' for innovative transport technologies and concepts for commercial transport in Berlin. Polis Conference, November 2011, Brussels, Belgium http://www.polisnetwork.eu/uploads/Modules/PublicDocuments/laboratory-area-for-innovative-transport-technologies-and-concepts-for-commercial-transport-in-berlin.pdf Weber. A. et al. (2012) D5.2 Test site final report Berlin. CityLog project http://www.city-log.eu/en/deliverables
5.3) Contact for further details	If personal contacts were established please provide the name, email and telephone number Julius Menge Senate Department for Urban Development Principle Affairs of Transport Policy VII A W, Commercial Transport Am Köllnischen Park 3, 10173 Berlin Tel.: +49 (0)30 9025 - 1566 e-mail: julius.menge@senstadt.berlin.de
5.4) Date of review	Latest update of this format (06/03/2013)

5.5) Pictures	Location of the area in Berlin, Germany. In green are the limits of the Low Emission Zone. The Laboratory Area is marked in red. **Figure 12: Berlin Laboratory Area (a) localisation (b) map (c) satellite view**

Source: FIS Broker (a)



(b) (c)

2.1.8 ILOS - Intelligent Freight Logistics in Urban Areas, Vienna

1. Basic information	
1.1) Identification	**ILOS - Intelligente Güter-Logistik im Städtischen Gebiet (Intelligent Freight Logistics in Urban Areas)** AIT Austrian Institute of Technology GmbH ECONSULT Betriebsberatungsges.m.b.H. FLUIDTIME Data Services GmbH
1.2) Cluster	Urban Freight
1.3) Responsible review partner	ECONSULT Betriebsberatungsges.m.b.H.

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach X Public & private appr.
2.2) Actor classification	Research, Consulting, Software, Parcel Delivery
2.3) Geographical Area	Vienna, Austria
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☐ fully X partly ☐ planned
	Energy efficient Routing based on Floating Car Data is implemented and in use in various projects
2.5) Date of implementation	2010
2.6) Link to other clusters	eFreight, Green Logistics

2.7) Topics covered	*Which topics are covered by the practice? (BESTFACT priority topics in* **bold***)* ***Infrastructure and Technology*** ☐ **Access to transport networks, infrastructure and nodes** ☐ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☒ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ **Business to business (B2B) solutions, cooperation** ☐ **Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes)** ☐ **Communication between authorities: cooperation, procedures, legal frameworks** ☐ **Communication between businesses and authorities: coordination, consultation** ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ **Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery)** ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ **Service quality and sustainability agreements/certification** ☐ Transport management, fleet management ***Regulations and Policy*** ☐ **Access rules and restrictions of urban areas** ☐ **Land use and spatial planning: assessment and siting of transport facilities and infrastructure** ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ **Interoperability and standardisation: vehicles, equipment, loading units, infrastructure** ☐ **Safety and security: measures, regulations, insurance** ***Knowledge, Tools and Methods*** ☐ **Modelling and forecasting** ☒ **Data collection and statistics** ☐ Education and training ☒ **Working and implementation guidelines** ☐ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td colspan="2">Which transport modes/vehicle types are affected by the solution?
☐ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td colspan="2">The solution supports new planning and routing functions specifically designed for urban transport.</td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Alse the transshipment points and warehouses are effected by this solution, as the whole tour and trip planning effects the previous processes (picking, loading etc.) and the following processes (unloading, take over of goods etc.9</td></tr>
<tr><td rowspan="2">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☒ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☒ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☐ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☒ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td>2.11) Level within innovation cycle</td><td colspan="2">☒ Prototype tested, potential best practice to be followed within Bestfact
☐ Small scale trial under real business conditions, best practice under development
☐ Full developed best practice</td></tr>
</table>

3. Best practice

3.1) Description of the practice	The objective of ILoS is the development and definition of indicators to describe the saving potentials of transport tours in urban areas under consideration of traffic information obtained through Floating Car Data, as well as the development of appropriate quantification methods to deduct these indicators from route analyses in order to exploit a possible saving potential.
3.2) Success factors	As Floating Car Data are is actually one of the most extensive and detailed data source for mapping the traffic situation within a city, there is a high focus on developing services and applications based on these data and functionalities.
3.3) Main benefits	The main economic and ecological benefits are within the developed methods and indicators which allow a thorough quantitative analysis of urban transport routes including the consideration of traffic information obtained through Floating Car Data.
3.4) Barriers	The main barrier was recognised within the development of functions for real time applications and real time navigation, whereas for pre-trip planning suitable functions could be provided.
3.5) Common practice before implementation	Comprehensive and detailed traffic information was not included in such analyses.
3.6) Motivation/problem	The lack of knowledge about the effects of traffic on economic and ecologic aspects of urban freight transport routes.

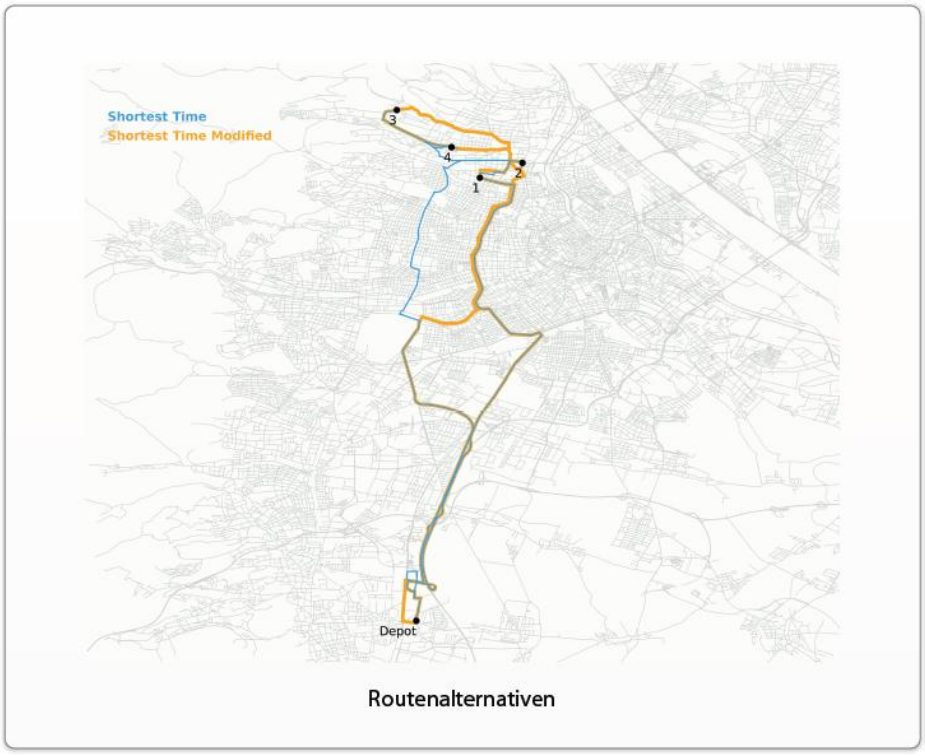
4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)? x Yes ☐ No
	Can be transferred to any urban region where floating car data sources are available.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? x Yes ☐ No
	The project is not focussing on any industries, but the urban freight topic as a whole.
4.3) Framework conditions and regulations	Are there political or regulatory framework conditions relevant / necessary for implementation of the case? ☐ Yes x No

	If there are data official available, the implementation of these data for optimisation purposes within business applicaitons should not be subject to any political or regulatory framework conditions.
4.3) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☐ Yes x No
	The evaluation in the project was only conducted for an urban area and is depending on available floating car data sources.
4.4) Similar cases	Unknown
Political framework conditions	-
Regulations	-

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes x No
5.2) References	Direct Information from the project owner. http://www2.ffg.at/verkehr/projekte.php?id=663&lang=de&browse=organisation

5.3) Contact for further details	Jakob Puchinger Mobility Department / Dynamic Transportation Systems AIT Austrian Institute of Technology Österreichisches Forschungs- und Prüfzentrum Arsenal Ges.m.b.H. Giefinggasse 2 | 1210 Vienna | Austria T +43(0) 50550-6461 | M +43(0) 664 210 65 09 | F +43(0) 50550-6439 jakob.puchinger@ait.ac.at | http://www.ait.ac.at Mag. Jürgen Schrampf ECONSULT Betriebsberatungsgesellschaft m.b.H. Jochen Rindt-Str. 33 1230 Wien, Austria T: +43-1-615 70 50-34 F: +43-1-615 70 50-33 M: +43-664-819 20 55 j.schrampf@econsult.at www.econsult.at
5.4) Date of review	06/03/2013

5.5) Pictures



Picture1 1: ILOS – routing alternatives

Picture 2: ILOS – Display of relevant information in the vehicle

2.1.9 iLadezonen in Vienna, Austria

1. Basic information	
1.1) Identification	iLadezonen introduced by ABC Consulting
1.2) Cluster	Urban Freight
1.3) Responsible review partner	ECONSULT Betriebsberatungsges.m.b.H.

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ■ Public & private appr.
2.2) Actor classification	- trading and retail - transport sector - parking control office
2.3) Geographical Area	Austria, Vienna
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☐ fully ■ partly ☐ planned
	The project is actually in the development and pilot stage.
2.5) Date of implementation	Start in 2011, available prototyping in 2012 at the ITS World Congress in Vienna. Project will be finalised in 2013.
2.6) Link to other clusters	eFreight

2.7) Topics covered	*Which topics are covered by the practice? (BESTFACT priority topics in* **bold***)* ***Infrastructure and Technology*** ■ **Access to transport networks, infrastructure and nodes** ■ Freight consolidation and transhipment ☐ Implementation of low emission technologies ■ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ■ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ **Business to business (B2B) solutions, cooperation** ■ **Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes)** ☐ **Communication between authorities: cooperation, procedures, legal frameworks** ■ **Communication between businesses and authorities: coordination, consultation** ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ **Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery)** ■ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ **Service quality and sustainability agreements/certification** ■ Transport management, fleet management ***Regulations and Policy*** ■ **Access rules and restrictions of urban areas** ■ **Land use and spatial planning: assessment and siting of transport facilities and infrastructure** ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ■ **Interoperability and standardisation: vehicles, equipment, loading units, infrastructure** ■ **Safety and security: measures, regulations, insurance** ***Knowledge, Tools and Methods*** ■ **Modelling and forecasting** ■ **Data collection and statistics** ☐ Education and training ☐ **Working and implementation guidelines** ☐ Monitoring and benchmarking of processes

2.8) Transport modes	Which transport modes/vehicle types are affected by the solution? ■ Road/ truck ■ Road/ delivery van ☐ Road/ motorcycles, scooter etc. ☐ Bike ☐ Heavy rail ☐ Light rail ☐ Inland waterway vessels ☐ Deep sea vessels ☐ Air freight/cargo planes ☐ Other: please explain …	
2.9) Supply chain elements	What other elements of the supply chain are involved in the practice? The solution involves mainly the elements of - transport - shunting, taxiing, idling - loading and unloading	
2.10) Which targets can be supported by the implementation?	*For public actors:* ☐ Efficient public spending ■ Ideal utilisation of infrastructure ■ Competitive logistics and transport system ■ Acceptance and influence ☐ Balanced provision of goods and services ■ Increased amenity value ■ Highest safety and security ☐ Others	*For private actors:* ■ Increased efficiency / productivity of logistics processes ■ Increased company profitability ☐ Minimisation of financial risks ■ Increased competitiveness ■ Increased quality ■ Image ■ Increased safety and security ☐ Others
	For both actor groups: ☐ Limited climate change ■ Reduced emissions ☐ Conservation of resources ☐ Others? Please specify: …	
2.11) Level within innovation cycle	☒ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☐ Full developed best practice	

3. Best practice

3.1) Description of the practice	Delivery fleets ensure a steady flow of goods to shops. Especially in populous, urban areas, the necessary delivery and pickup activities rely on the availability of dedicated loading zones. Unlawful usage of such zones, e.g. for parking purposes, delays delivery of goods, disrupts traffic flow, causes additional traffic and endangers drivers and pedestrians. The project i-Ladezone focuses on two major topics. The first is the development of management methods in order to open deliver opportunities for an efficient and effective monitoring of the occupancy of loading zones by loading vehicles and private cars, the second topic focuses on the development of a management system for keeping the loading zones at a maximum availability and reduce impacts on traffic by the loading processes. Also included is the development of an intelligent routing application for mobile use for the drivers of the goods suppliers. In the first project part, technologies and algorithms for an efficient and effective monitoring of loading zones will be developed and comparatively tested. As a result, smart units will be developed, which can easily be installed at the location of the zones and monitor the occupancy by vehicles and if they are authorized to do so. So loading zones for suppliers will be kept available and free for their use, the traffic flow would be improved and traffic jams due to parking in second line or else can be reduced. Furthermore, the behavior of road users will be evaluated (pre-/follow up investigation) before and after the monitoring systems installation. In the second project part an intelligent loading zone routing application will be developed for the first time. Within i-Ladezone the special routing system will implement the geographical position and the address of the loading zone itself as starting or destination point. The system delivers dynamically additional information of the loading zone application (e.g. occupancy, officially permitted loading times). With this real-time information at hand the system will be able to calculate the optimal route for delivery services at any time. The expected results will essentially contribute to an efficient, ecologically and intermodal delivery system within metropolitan areas. Last not least the possible integration in an overall traffic management system (“smart cities”) will be investigated. i-Ladezone acts as specialized sub-part of a kind of “sensor” monitoring special traffic zones as described, but also can extended to other zones to be monitored.

3.2) Success factors	The project „i-Ladezone“ (Ladezone is the German word for delivery space) focuses on two broad topics. On the one hand, opportunities for efficient and effective monitoring of loading zones (management methods) will be deduced. On the other hand, an intelligent loading zone routing as mobile application (management system) will be developed. The i-Ladezone approach focuses on these two issues and will not consider a holistic approach like the EU project Freilot. The i-Ladezone project does not concentrate on traffic management, vehicle acceleration speed limitation or driver support for green driving. Further more the city of Vienna has decided (by a referendum) not to implement any kind of city enforcement systems. Therefore congestion charge or booking systems will not be realisable in Vienna in the near future. i-Ladezone is for optional use and should raise of awareness. Further more it can be a supporting tool for the manual parking enforcement.
3.3) Main benefits	An intelligent truck routing for urban areas will enhance ecological and economical issues, respectively. i-Ladezone will provide loading zones as POI with further information like “occupied” or “free”, the dimension and length of the zone and officially permitted loading times. Furthermore, i-Ladezone will help to avoid additional traffic through residential areas and will inform truck drivers with useful additional traffic information. Last but not least, i-Ladezone will be easy to use and can be integrated in city logistics services. Within the area of the city of Vienna the traffic management project of the provinces Vienna, Lower Austria and Burgenland, ITS Vienna Region, has shown interest to provide the finalised i-Ladezone service as special service for truck drivers delivering goods. The basis for the routing will be the GIP (Graph Integration Platform), an Austrian wide multimodal common digital network. As loading zones are currently not recorded within the GIP, these will be digitalised and integrated in the GIP within i-Ladezone.
3.4) Barriers	As the loading zones in the city of Vienna are not fully digitalised yet, the exact numbers of loading zones are not known. Estimations range from approximately 2500 to 3000 loading zones. With the interface developed within the project to the “official” ITS platform of the City of Vienna, i-Ladezone could help to reach more holistic objectives.
3.5) Common practice before implementation	Currently loading zones (delivery space) in public streets are often used by unauthorized vehicles, especially private car drivers. Therefore trucks delivering goods are often forced to stand in the second lane, so called double lane stops.

3.6) Motivation/problem	Loading zones are not displayed as POI (Point of Interest) by navigation systems and traffic information services. Usually only bigger parking areas are located. As a consequence routing to a loading zone destination in front of the customer (shop or warehouse) becomes difficult. The control and enforcement of loading zones is mainly done manually and is therefore very inefficient. This causes a number of problems like unnecessary traffic, additional pollution, obstruction of traffic and traffic flow, longer loading times, safety issues on the road, difficult detection and execution of misconduct.
4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)? ■ Yes ☐ No
	The project develops and compares different opportunities for efficient and effective monitoring of loading zones. This monitoring system should be easy to install, operate and use also in other areas.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	The users (drivers) behaviour will be evaluated before and after installation of the system. The monitoring will be done on two levels, first a technology based and secondly a user based approach. In a first step the system has to detect if a loading zone is being used at all. In a second step it will check if the user is legitimated to use the loading zone. The free/used check can be done easily e.g. by video and/or ultrasonic sensors. Such systems are already in use in several cities. The second check, if this user is legitimated, will be done by ANPR, DRSC or RFID. This technology based approach will be extended by a user-based approach, which relies on either crowd information of interested parties like truck drivers, shop managers, executive personnel (police or special city enforcement) or security employees. A combination of several approaches is possible and useful. Furthermore in various areas different systems or combination of different parts seem also useful. All technical equipment will be designed for solar power operation.
4.3) Framework conditions and regulations	Are there political or regulatory framework conditions relevant / necessary for implementation of the case? ☐ Yes ■ No
	Not yet determined and probably different in various countries.

4.3) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ■ Yes ☐ No
	Can be used for all kind of loading zones.
4.4) Similar cases	Unknown

5. Additional information	
5.1) Considera-tion for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ■ No
	It is still in a prototype phase.
5.2) References	ABC Consulting http://www.anachb.at/ http://www.freilot.eu/ http://de.wikipedia.org/wiki/Innenstadtmaut http://www.ftw.at/projects/roadsafe http://www.complang.tuwien.ac.at/
5.3) Contact for further details	Alexander Chloupek ABC Consulting Gartengasse 19a / 1 / 4, 1050 Vienna, AUSTRIA Tel: +43 1 5458430 Mail: abc@abc-consulting.at Further Project Partners: AIT - Austrian Institute of Technology GmbH Fluidtime Data Services GmbH, Snizek + Partner Verkehrsplanungs GmbH Prosoft Süd Consulting GmbH SLR Engineering PRISMA solutions EDV-Dienstleistungen GmbH Heimbuchner Consulting GmbH DI Alexander Fürdös
5.4) Date of re-view	06/03/2013

5.5) Pictures

Please link, attach or insert pictures, pictograms etc. that show the main idea of the case (for broad publication)

Figure 1 – Private cars in loading zone Troststraße/Vienna

Figure 2 – Integration of loading zones in the GIP (GraphIntegrationPlatform)

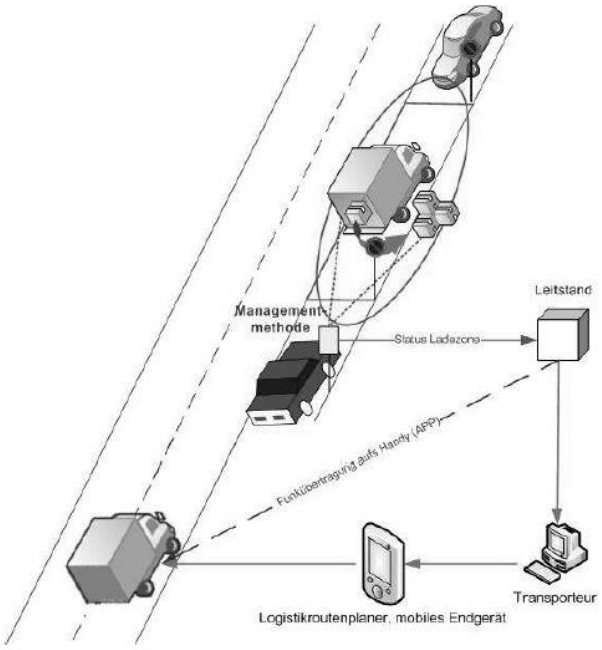


Figure 3 – System overview of *i-Ladezone*

2.1.10 Multiuse lanes for freight distribution in Bilbao

1. Basic information	
1.1) Identification	Project: Optimization Plan for the urban freight distribution in Bilbao Case name: Multiuse lanes for freight distribution Introduced by ITENE
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible review partner	ITENE

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach X Public & private appr.
2.2) Actor classi-fication	- Bilbao city - Transport operators. Any branch of industry - Mobility and Logistics Cluster - Municipal Police
2.3) Geographical Area	Spain, Bilbao
2.4) Implementa-tion status	To what extend is the solution implemented / in operation? Please indicate and explain. X fully ☐ partly ☐ planned
2.5) Date of im-plementation	3th May 2010
2.6) Link to other clusters	eFreight

2.7) Topics covered	*Which topics are covered by the practice? (BESTFACT priority topics in* **bold***)* ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☐ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) X Communication between authorities: cooperation, procedures, legal frameworks X Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) X Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** X Access rules and restrictions of urban areas X Land use and spatial planning: assessment and siting of transport facilities and infrastructure X Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting X Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

2.8) Transport modes	Which transport modes/vehicle types are affected by the solution? X Road/ truck X Road/ delivery van X Road/ motorcycles, scooter etc. ☐ Bike ☐ Heavy rail ☐ Light rail ☐ Inland waterway vessels ☐ Deep sea vessels ☐ Air freight/cargo planes ☐ Other: please explain …	
2.9) Supply chain elements	What other elements of the supply chain are involved in the practice? The solution involves mainly the elements of: - Transport - Loading and unloading activities	
2.10) Which targets can be supported by the implementation?	*For public actors:* ☐ Efficient public spending X Ideal utilisation of infrastructure ☐ Competitive logistics and transport system X Acceptance and influence X Balanced provision of goods and services ☐ Increased amenity value X Highest safety and security ☐ Others	*For private actors:* X Increased efficiency / productivity of logistics processes X Increased company profitability ☐ Minimisation of financial risks X Increased competitiveness X Increased quality X Image X Increased safety and security ☐ Others
	For both actor groups: ☐ Limited climate change X Reduced emissions X Conservation of resources ☐ Others? Please specify: …	
2.11) Level within innovation cycle	☒ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☐ Full developed best practice	

3. Best practice

3.1) Description of the practice	The idea resides in taking a lane to function more 'natural', meeting the needs of traffic and based on time slot: • Free parking: from 9:00 pm to 8:00 am • Booking for loading and unloading (industrial vehicles only): from 08:00 am to 12:00 • Normal circulation: from 12:00 to 9:00 pm
3.2) Technical main characteristics	• The road must have two or more lanes in the same sense. • The traffic density in a limited time window permits to eliminate a lane, without disturbing its capacity. • It must be a commercial area (250 m influence) with enough entity to justify the implementation. • Along the selected lane length, cannot exist any bus stop or garage access.
3.3) Success factors	The improvement of the urban freight distribution in Bilbao is possible through consensus and collaboration of all stakeholders, both private and public, in the work of loading and unloading of the Villa
3.4) Main benefits	The real benefits have been: • Reduction of parking violations. • Optimization of the distances travelled. • Satisfaction of the carriers, legal parking vs. illegal parking. Therefore, less fines. • Satisfaction of the neighbours • Reducing pollution by less lag in the second row. • Extension of parking space in peak hours.
3.5) Cost indication	610€ cost implantation
3.6) Barriers / Limitations	The most critical aspect was to signalise correctly to drivers that three lanes road, suddenly became in tow lanes road, as this located on the left side was use as a multiuse lane.
3.7) Common practice before implementation	Previous the implementation the lane was illegally used by vans and private vehicles committing loading and unloading activities.
3.8) Motivation/problem	Improve the security on the road signalising correctly the loading and unloading activities done on the lane and give another use to the lane at night, when the traffic density is very low.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, and size)? ☒ Yes ☐ No

4.2) Usability in other domains	Can the solution be transferred to other actors or industries? X Yes ☐ No
4.3) Framework conditions and regulations	Are there political or regulatory framework conditions relevant / necessary for implementation of the case? Yes X No
	The multiuse lane was implemented fulfilling the rules already existing in the city.
4.3) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nationwide?) X Yes ☐ No
	Can be used for all kind of streets with the same conditions
4.4) Similar cases	Multiuse lanes in Barcelona
Political framework conditions / Regulations	The multipurpose lane extends the total length of these lanes and converts the free parking spaces for Loading and Unloading on the preset time slots. In addition, during the peak hours, the lane is used as a priority bus lane.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes X No
5.2) References	Clúster de Movilidad y Logística, MLC ITS Euskadi http://www.mlcluster.com
5.3) Contact for further details	Fernando Zubillaga 945 10 80 88 fzubillaga@clustertil.com
5.4) Date of review	06/03/2013

5.5) Pictures	Please link, attach or insert pictures, pictograms etc. that show the main idea of the case (for broad publication)

Picture 1: Measurement location

2.1.11 Logistics tool for delivery management for trade fairs, Messe Basel

1. Basic information	
1.1) Identification	Logistics tool for delivery management for trade fairs, Messe Basel
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible authors/	Rapp Trans AG, Zurich: Simon Bohne The delivery management project was developed by Rapp Trans AG, Basel The project owner is MCH Group AG, Basel

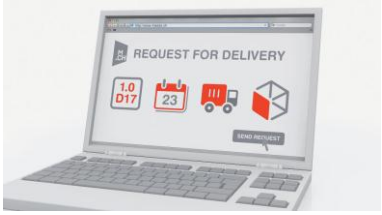
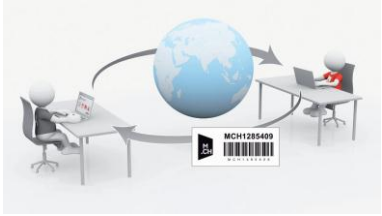
2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Trade fair operators and related service provider, exhibiting companies at trade fairs, logistics service providers delivering for trade fairs
2.3) Geographical Area	The tool was designed for the trade fair in Basel, Switzerland (Messe Basel)
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
2.5) Date of implementation	The development of the tool started in January 2011, the online registration webpage went online in December 2011 while the first trade fair where the use was obligatory was held in March 2012
2.6) Link to other clusters	The tool used for the delivery management can be also regarded as a limited e-freight solution; providing an interface between trade fair operator and logistics service provider. An extension of the use of the technology to other domains and on a wider scale on other campuses and logistic intensive facilities (e.g. airports, harbours etc.) would be a good case to be considered in cluster 3.

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☒ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☒ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☒ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☒ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☒ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☒ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td>Only road access to the trade fair facilities is possible</td></tr>
<tr><td>2.9) Supply chain elements</td><td>The logistics service provider of the trade fair is taking over the loads of deliveries at the entry point to the fair grounds. Thus following processes are involved:
• Transport (only a limited part of the tour)
• Loading/Unloading
• Handling
• Shunting, taxiing on the fair grounds
• Unpacking and packing of delivered materials</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☒ Increased quality
☐ Image
☒ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
☐ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td colspan="2">Please specify all other and different targets here…</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☒ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☒ Quality of services ☒ Reduced congestions ☐ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…
2.12) Level with-in innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☒ Small scale trial under real business conditions, best practice under development ☐ Full developed best practice

3. Best practice

3.1) Description of the practice	Exhibitors, stand builders and other suppliers have to register online and in advance for all deliveries, pick-ups and transports to the fair grounds. All logistic processes on the grounds are exclusively handled by the domestic logistics operator. Confirmed and registered vehicles receive a delivery pass which contains a date and fixed time slot for delivery, information about the loading, company- and vehicle information. This information is also coded in a bar code for faster checking at the stations. At the designated time the vehicle has to check in at the fair ground check point, where all delivery information and cargo is verified and a parking space is assigned. Upon verification an access pass is handed to the driver including directions to the optimum delivery zone, where the loading is transhipped and therefore only handled by the fair ground logisticians. The time allotment for a vehicle in the delivery zone depends on vehicle type and loading. After transhipment the truck has to be removed from the fair grounds and takes a new trip. The registration for deliveries or pick-ups is generally free of charge if performed regularly 7 days in advance. On shorter notice, up to 24h ahead, it incurs a charge; the scale depends on the specific event and ranges between €80 and €420. The steps in the process: Online registration of a delivery  Online confirmation with bar code  Access during time slot at check point  Access denied if time slot is missed 

3.2) Technical main characteristics	A developed online tool (accessible via https://ims.messe.ch) available in 5 languages (German, English, Spanish, French, Spanish) needs to be used for booking of timeslots for deliveries. The needed login for the tool is send to exhibitors upon registration for a trade fair. An access pass has to be printed from a PDF format and be presented upon delivery.
3.3) Success factors	• Optimal operative processes dictated functions and development of the logistics tool (not the other way around) • Open and early communication strategy towards all involved actors and intuitive manuals and documentation • Thorough and stepwise testing before implementation • Close cooperation of involved actors (operators, city's urban planning department, IT department, project developers, marketing, customers)
3.4) Main benefits	A quantification of benefits does not exist yet and would be difficult to achieve. Traffic situation on access roads and in the vicinity of the fair grounds in delivery and pick-up phases has generally increased. Congestion levels were not measured. At the check point and the delivery zones no congestion occurred at all. For the fair ground logisticians the situation improved vastly with introduction of time slots due to better planning of capacities. The efficiency of all logistic processes at the fair grounds improved according to feedback. The acceptance was very high, for the first fair event where the tool was in use almost 90% of the about 7'000 trips were pre-registered.
3.5) Cost indication	Main cost factors were the project development and the IT implementation. In other typical cost domains negative effects were prevented. Marketing efforts were sought by the individual fair events and the tool was adapted to the most efficient operational processes.
3.6) Barriers / Limitations	The main problem was the acceptance and support of the customers (stand builders, exhibiting companies, fair event agencies) since a major part of planning ahead was required by them that was before dealt with on a more short-notice and operational basis by the trade fair logisticians. An early and open communication strategy helped to overcome these problems and allowed to demonstrate benefits for all users of the tool.
3.7) Common practice before implementation	The usual common practice was that broad daily time windows were set wherein exhibitors could directly deliver their tools, equipment and materials for building their fair booths and their setup to the reserved location on the fair grounds. In 2010 the fair operator made the use of their own logistics operator on the grounds compulsory. Exhibitors were asked to deliver their goods to a transfer station where they were taken over by the fair logistics vehicles for the last section of transport to the designated locations.

3.8) Motivation/problem	The fair grounds in Basel are located in a central part of the city. The access roads are narrow and do not allow for shunting with trucks. The space for parking and idling is also very limited around the grounds since they are integrated in a residential and public area. The buildings and fair ground facilities are also undergoing major construction works even further limiting the space available. The limitation of space led the fair ground operator to develop a new management for the logistics on their grounds. Limiting conflicts between trucks manoeuvring, loading/unloading or waiting and parking in the vicinity.
3.9) Justification of practice	The case delivers a relatively simple solution for the specific problem of the Basel fair grounds while also being a transferable solution that can be adapted by many similar urban facilities or logistic intensive campuses. The shift of planning ahead from the fair operator to the exhibitors and their logistics service provider was achieved right from the start. The increased complexity for the delivery planning was accepted while benefits resulted for all involved actors. While the complexity for the campus management is explicitly reduced a comparable solution on this scale is not known

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	No special requirements towards the implementation of the management system are needed
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The management system could be used for all delimited areas, with limited space and with high traffic intensity, or where the use of a single logistics service provider is compulsory. Other domains could include: harbours, airports or larger public events
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	Since the referenced case is employed on private grounds it is not bound to specific political framework conditions or regulations.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No

	The solution could be most likely used on all trade fairs in Europe or other comparable campuses (see above)
4.5) Similar cases	A similar case where the use of a central logistics service provider on the fair ground in combination with an online pre-registration for the delivery management is in place is not known.
5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The high level of acceptance, transferability and benefits provided makes this case a good candidate for in-depth review. The difficult analysis of quantifiable results only slightly reduces the attractiveness of the case presentation.
5.2) References	MCH Logistics Tool Brochure: http://media.messe.ch/epaper/mch/2011/en/Logistik_Prozess/index.html Rapp Trans AG project information: http://www.rapp.ch/en/trans/our-services/application-areas/logistics/Referenzen/4_Logistiktool-Messe-Basel.php Logistics process description for BASELWORLD 2012: http://www.mch-group.com/~/media/mch-group/Documents/PdfTemplates/Standorte/Basel/Logistik/NM%20Logistik_Prozess_Aussteller_Standbauer_BW12_V5a_en.ashx Benz, Simon (2012): Logistiktool MCH Messe Basel, Company presentation (not public, available upon request: simon.bohne@rapp.ch)
5.3) Contact for further details	Simon Benz, Rapp Trans AG Basel, +41 61 335 79 10, simon.benz@rapp.ch Joachim Ruf, Fair Grounds Basel, Joachim.Ruf@messe.ch
5.4) Date of review	06/03/2013

5.5) Pictures

A video and brochure of the practical use of the tool can be found on the operators webpage: http://www.mch-group.com/en-US/Exhibitor/MesseBasel/Services/Logistics.aspx

Figure 5: Example of a delivery pass

Figure 6: Example of an access pass

Figure 7: Situation of fair grounds in Basel with construction

Figure 8: Situation before implementation of the tool, individual deliveries still possible

Figure 9: Situation after implementation of the tool

2.1.12 Network of four Urban Retail Distribution systems in Lithuania

1. Basic information	
1.1) Identification	**Network of four Urban Retail Distribution systems in Lithuania** **Urban logistics: oligopoly retail systems**
1.2) Cluster	Urban Freight
1.3) Responsible review partner	Vilnius Gediminas technical university

2. Scope of practice	
2.1) Approach	X Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Retail
2.3) Geographical Area	Lithuania
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. X fully ☐partly ☐ planned
	Four largest retail chains account for 80 per cent of total retail market. Three out four chains has similar principles of optimising logistic operations in urban areas.
2.5) Date of implementation	2009
2.6) Link to other clusters	Green Logistics

2.7) Topics covered	*Which topics are covered by the practice? (BESTFACT priority topics in* **bold***)* ***Infrastructure and Technology*** ☐ **Access to transport networks, infrastructure and nodes** X Freight consolidation and transhipment ☐ Implementation of low emission technologies X IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment X ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** X **Business to business (B2B) solutions, cooperation** ☐ **Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes)** ☐ **Communication between authorities: cooperation, procedures, legal frameworks** ☐ **Communication between businesses and authorities: coordination, consultation** X Business models: new form of ownership, risk management ***Operations and Services*** X **Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery)** X Innovative operational solutions X Value added services, development (or extension) of services ☐ **Service quality and sustainability agreements/certification** X Transport management, fleet management ***Regulations and Policy*** ☐ **Access rules and restrictions of urban areas** ☐ **Land use and spatial planning: assessment and siting of transport facilities and infrastructure** ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ **Interoperability and standardisation: vehicles, equipment, loading units, infrastructure** ☐ **Safety and security: measures, regulations, insurance** ***Knowledge, Tools and Methods*** X **Modelling and forecasting** ☐ **Data collection and statistics** ☐ Education and training ☐ **Working and implementation guidelines** X Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td colspan="2">Which transport modes/vehicle types are affected by the solution?
X Road/ truck X Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
X Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td colspan="2">The solution involves optimized logistic operations involving multi-modal transport chains.</td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Shipping process is controled by small number of operators or single operator to serve all shops in retail chain from single logistics centre. Shippment chain is optimized involving heavy rail and container operations, as well as consolidation of cargo to single large vehicle instead of multiple smaller vans.</td></tr>
<tr><td rowspan="2">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
X Ideal utilisation of infrastructure
X Competitive logistics and transport system
☐ Acceptance and influence
X Balanced provision of goods and services
☐ Increased amenity value
X Highest safety and security
☐ Others</td><td>For private actors:
X Increased efficiency / productivity of logistics processes
X Increased company profitability
☐ Minimisation of financial risks
X Increased competitiveness
X Increased quality
☐ Image
X Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
X Reduced emissions
X Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td>2.11) Level within innovation cycle</td><td colspan="2">☐ Prototype tested, potential best practice to be followed within Bestfact
☐ Small scale trial under real business conditions, best practice under development
☒ Full developed best practice</td></tr>
</table>

3. Best practice

3.1) Description of the practice	Oligopoly of several retail chains lead to highly optimised urban logistics solutions: large number of shops is located in all towns and cities across the country. All these shops are served from several logistic centres, where requested goods are loaded in consolidated shipments to large vehicles thus reducing number of trips made to supply each shop. As overall number of vehicles and trips is reduced, positive impact on emission is achieved. Optimization of shipping costs is achieved this way as well. Safety and security is increased, as several, well controlled operators are in charge of transport operations.
3.2) Success factors	Natural oligopolies lead to optimized logistics operations.
3.3) Main benefits	Retailers benefit from cost-effective, timely, controlled and efficient shipments.
3.4) Barriers	The main barriers are large number of different goods to be delivered, making operations highly complicated.
3.5) Common practice before implementation	Large number of private shops which were served by smaller vans arriving at higher frequency.
3.6) Motivation/problem	The lack of concern of impact of large vehicles in the urban environment (e.g. city centre) to infrastructure and environment.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)? x Yes ☐ No
	Can be transferred to any urban region where retail shops exist.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? x Yes ☐ No
	Supply chains are optimised to serve large retail shops (large number of items in every shipment, frequent shipments) and food industry chains could benefit from same model.
4.3) Framework conditions and regulations	Are there political or regulatory framework conditions relevant / necessary for implementation of the case? x Yes ☐ No
	Business freight solutions should not be subject to any political or regulatory framework conditions except for implementation of environmental regulations.

4.3) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) x Yes ☐ No
	International chains would benefit from using strategically located multiple logistics centres.
4.4) Similar cases	Unknown
Political framework conditions	-
Regulations	-

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? x Yes ☐ No
	This case is example of very high degree of freight operation optimisation.
5.2) References	-
5.3) Contact for further details	Andrius Jaržemskis Vilnius Gediminas technical university Sauletekio av. 11 | LT–10223 Vilnius | Lithuania andrius.jarzemskis@vgtu.lt | www.vgtu.lt
5.4) Date of review	November 2012

5.5) Pictures

Figure 10: Location of single logistics centre (Rivona) in optimized location to serve all retail chain shops (marked with orange markers)

2.1.13 Optimisation of waste collection in Maribor

1. Basic information	
1.1) Identification	Optimisation of waste collection in an urban environment with the use of optimisation algorithms and Geographic Information Systems (Snaga d.o.o. (Maribor, Slovenia); public waste management company)
1.2) Cluster	Cluster 1 - Company engagement in efficient use of light and heavy goods vehicles in urban areas
1.3) Responsible authors/	Mitja Stiglic (UNI MB, Maribor, Slovenia) Darko Becaj (Snaga, Maribor, Slovenia) Katja Hanzic (UNI MB, Maribor, Slovenia)

2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Waste management
2.3) Geographical Area	Maribor, Slovenia
2.4) Implementation status	☒ fully ☐ partly ☐ planned
	The solution was implemented however further improvements are foreseen.
2.5) Date of implementation	2008
2.6) Link to other clusters	• The BP case is linked to CL2, topic “Towards measures of large impact to reduce the CO2 emissions of freight logistics”

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☐ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☒ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☒ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck (Waste collection trucks) ☐ Road/ delivery van
☐ Road/ motorcycles, scooter etc. ☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td></td><td></td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Loading and Transport</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
☒ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☒ Increased company profitability
☐ Minimisation of financial risks
☒ Increased competitiveness
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☐ Increased safety and security
☐ Others</td></tr>
<tr><td></td><td colspan="2">For both actor groups:
☐ Limited climate change
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☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td>2.11) End-user benefits</td><td colspan="2">Where do end-users benefit?
☐ Affordable services (e.g. new affordable services or price reductions)
☐ Services in rural areas (new/additional service areas)
☒ Quality of services
☐ Reduced congestions
☒ Reduced emissions
☐ Reduced climate change
☐ Reduced noise pollution
☐ Implementation degree
☐ High level of acceptance of solution/practice
☐ Other benefits: (please specify)…</td></tr>
<tr><td>2.12) Level within innovation cycle</td><td colspan="2">☒ Prototype tested, potential best practice to be followed within Bestfact
☐ Small scale trial under real business conditions, best practice under development
☐ Full developed best practice</td></tr>
</table>

3. Best practice	
3.1) Description of the practice	The waste management company Snaga d.o.o. is responsible for waste collection in the Municipality of Maribor and 8 other smaller adjacent municipalities. Altogether, the managed municipalities have approximately 129.000 residents. Pickup locations are dispersed on an area with a diameter of around 20 km from the central vehicle depot. The covered terrain is very varied, ranging from urban areas with high population densities to rural areas with very low densities. This area is covered with a fleet of 21 waste collection vehicles. After the enacting of new regulations on waste separation for households the waste management company was faced with important changes in waste collection patterns and route planning requirements. The new regulations required separate curb side pickup of packaging (PET, PS, PE, ALU, etc.), which ensued in additional pickup routes with a different geographic pattern than for other types of waste. The initiative for the project came from Mr Darko Bečaj, the fleet manager of Snaga d.o.o. who was doing his master thesis at the University of Maribor. Mr Bečaj is responsible for the planning of pickup routes, which is done on a yearly basis. He uses different types of tools for planning and heavily relies on the use of GIS (geographic information systems). Under his leadership, the company also implemented GPS on-board units in the entire fleet in order to get the exact geographic locations of pickup locations and other valuable data, which was imported into GIS. In order to organize the process of packaging collection more optimally, Mr. Becaj decided to carry out an optimisation project with the support of the University of Maribor. The main goals were to assess the effectiveness of algorithms for planning of waste collection routes, estimate potential savings, and reorganize collection processes according to the results of optimisation. After having followed lectures in Operations Research, he identified important optimisation potentials in the way the waste collection routes are being planned. With the support of two mentors (dr. Sever, ddr. Žerovnik) from the University of Maribor, he analysed the nature of the problem and identified a few standard approaches to solve it. After careful consideration, he opted to use the approach of the “Chinese postman” since capacity constraints were not relevant for this category of waste (packaging is very light and can hardly fill up the capacity of the used vehicles). Using an algorithm for the solving of the “Chinese postman problem” he obtained a set of more optimal vehicle routes and managed to increase the efficiency of the pickup process. The chosen approach enabled the company to improve the efficiency of waste collection by 20%. Using the same resources, the company was able to reduce the number of working days needed to collect waste from 5 to 4. This enabled the relocation of work teams to other assignments.

3.1) Description of the practice (continue)	Optimisation of routes had the following effects: • lower number of required vehicles; • less work teams on field; • less driven kilometres and lower fuel consumption; • lower CO_2 emissions of the company. The main limitation of the project was that optimisation was not carried out using a customised optimisation tool for waste management, but with the use of basic optimisation programs developed for academic purposes, which use advanced algorithms, but do not enable visualisation and other user-friendly features. This required a lot of manual work and the use of different programs. The approach has been used to optimise only a part of the operations of the company – optimisation on a larger scale would not have been feasible. However, based on the results of the project, the company is now considering implementing a comprehensive software solution for optimisation, which would enable it to optimize the waste collection routes of its entire fleet (for all waste types).
3.2) Technical main characteristics	Waste collection of packaging (PET, PS, PE, ALU, etc.) in the municipality of Maribor and 8 other smaller adjacent municipalities with app. 129.000 residents with a fleet of 21 vehicles.
3.3) Success factors	The main reason for the success is the approach taken by Mr. Bečaj using the algorithm for the solving of the “Chinese postman problem” and the quality of input data used. It must not be omitted that Mr. Bečaj’s detailed knowledge on the day-to-day operations of the company which helped him with understanding the problem and finding more optimal solution than the existing ones.
3.4) Main benefits	Optimisation of waste collection routes has been shown to generate important savings through numerous case studies in different countries, regions, and settlement patterns (often producing economies of more than 20 %). Hence, there is enough empirical evidence to support the conclusion that optimisation of waste collection is, generally speaking, economically justified and delivers many benefits to the waste management company as well as to the municipality.
3.5) Cost indication	The bulk of the costs of the described project was related to the work of Mr Bečaj who invested a lot of his time in determining the problem, analysing the data and computing solutions. The costs for the waste management company were not significant in this case. However, in case the company would choose to implement a comprehensive software solution in order to manage its entire business more optimally, the costs would be significant, both in terms of software costs, implementation costs and training of staff.

3.6) Barriers / Limitations	Local conditions need to be thoroughly analysed before implementation in order to choose the most appropriate software solution. It is generally recommendable to ask the software vendor to carry out simulations with the software in order to determine its usefulness for solving the specific case. Without a proper simulation, it is very difficult to estimate the potential savings and financial indicators, such as ROI, payback period, etc. – these depend on many factors. For instance, the potential savings depend on the flexibility of workers' contracts, since work schedules often need to be changed in order to allow enough flexibility in the duration of planned routes. The results also strongly depend on the quality of the input data – the better the input the better are the results.
3.7) Common practice before implementation	
3.8) Motivation/problem	New regulations on waste separation for households have caused important changes in waste collection patterns and route planning requirements in the waste management company. The new regulations required separate curb side pickup of packaging (PET, PS, PE, ALU, etc.), which ensued in additional pickup routes with a different geographic pattern than for other types of waste.
3.9) Justification of practice	The solution includes the innovative approach of Operations research (the algorithm for solving the Chinese postman problem) in order to solve the problem of optimisation of waste vehicle routing in urban areas. The improvement in efficiency of waste collection by 20% means lower costs for the company (business objective) as well as less pollution in urban areas (policy objective). The solution is easily transferable to other companies.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	No special requirements for transfer however legal restraints (waste management legislation, environmental legislation as well as on labour legislation) and input data have to be taken into consideration
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The solution is in its core general so it can be transferred to other actors and/or industries facing similar problems.

4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	The solution is based on optimisation methods that do not require any political framework to be in place. Still it should be pointed out that existing legislation must be considered before the implementation.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☐ Yes ☒ No
	The solution can be extended to other cities in the country however the problem is city specific and linked to waste management (handled in each city separately) so the implementation nationwide is questionable.
4.5) Similar cases	None to our knowledge

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Even though waste management companies can improve their profitability and sustainability by minimizing the length of routes their trucks drive, cutting their overall fuel consumption and decreasing their carbon footprint, the described approach can be used on a smaller scale as a lot of work must be invested into determining the problem, analysing the data and computing solutions.
5.2) References	http://dkum.uni-mb.si/Dokument.php?id=6974
5.3) Contact for further details	Darko Becaj darko.becaj@snaga-mb.si
5.4) Date of review	06/03/2013

5.5) Pictures

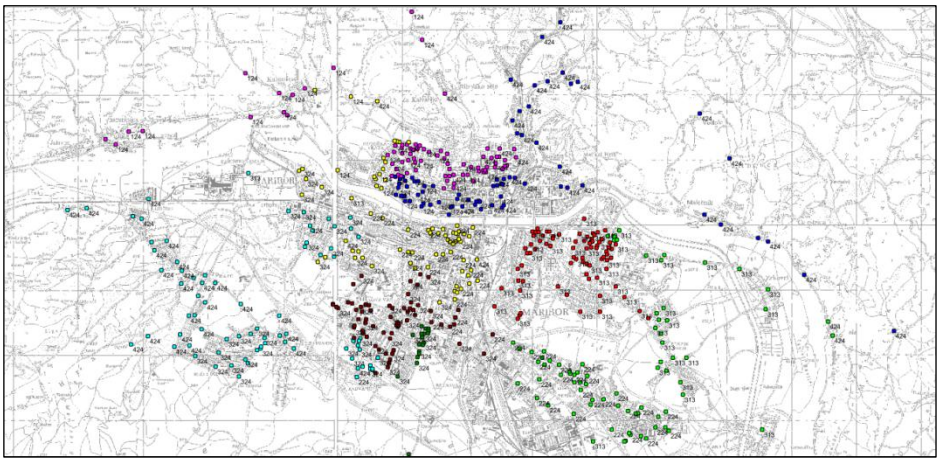

Figure 11: Allocation of picking locations to 8 waste vehicle routes in Maribor

(each colour represents a different route)

2.1.14 Zero emission boat in Utrecht

1. Basic information	
1.1) Identification	Zero emission boat, Utrecht, Netherlands
1.2) Cluster	Cluster 1, urban freight
1.3) Responsible authors/	Konstantina Laparidou (Panteia)

2. Scope of practice	
2.1) Approach	☐ Private approach ☒ Public approach ☐ Public & private appr.
2.2) Actor classification	Implementation/ funding: the municipal department of public works (SW) of Utrecht The Zero Emission Boat is used by 4 different brewers, 1 catering industry wholesaler and 65 clients
2.3) Geographical Area	The practice will be implemented in the Netherlands (the Utrecht region)
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	In 2012, there will be a new boat (larger for heavier cargo)
2.5) Date of implementation	2010
2.6) Link to other clusters	

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☒ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☒ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td colspan="2">Which transport modes/vehicle types are affected by the solution?
☐ Road/ truck ☐ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☒ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td>2.9) Supply chain elements</td><td colspan="2">Suppliers, carriers, clients</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☐ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☒ Increased competitiveness
☐ Increased quality
☐ Image
☐ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td colspan="2"></td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☒ Reduced congestions ☒ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☐ High level of acceptance of solution/practice ☒ Other benefits: (deliveries outside the road vehicle restriction scheme)…
2.11) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

3. Best practice	
3.1) Description of the practice	The delivery from 4 breweries and 1 catering industry to 65 clients along the canals of Utrecht is performed via an electric zero emission boat
3.2) Technical main characteristics	The electric Zero Emission Boat uses green energy and can be used 8-9 hours on one charge.
3.3) Success factors	Cost efficient, time-efficient (not dependent on time windows) Reducing almost 17 tonnes of CO2 annually Preservation of the bridges and roads of Utrecht Publicly owned (small private costs)
3.4) Main benefits	
3.5) Cost indication	Not available
3.6) Barriers / Limitations	Technical limitations of the vehicle (sorted by scheduling) Financial barriers (investment costs)
3.7) Common practice before implementation	Transportation by trucks in specific timeframes

3.8) Motivation/problem	1. Decrease road goods traffic in the city centre; and 2. Make better use of the potential for waterborne transport for supplying the city.
3.9) Justification of practice	Convenient solution for urban transport, environmental benefits, easy to transfer to similar natural environments

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Depending on natural infrastructure
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	Perhaps, vehicle safety regulations
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	It is already mentioned that other Dutch cities (such as Amsterdam, Gouda or Woerden) would like to engage this solution.
4.5) Similar cases	Transportation of freight via alternative vehicles is already implemented in several occasions. However, the use of a boat is unique in the Netherlands and in Europe.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☐ No

5.2) References	TURBLOG report http://www.energy-cities.eu/Take-a-tip-from-Utrecht http://www.civitas-initiative.org/index.php?id=79&sel_menu=134&measure_id=617
5.3) Contact for further details	
5.4) Date of review	06/03/2013
5.5) Pictures	 Source: http://www.stichtingmilieunet.nl/andersbekekenblog/openbaar-vervoer/elektrische-zero-emission-bierboot-in-de-vaart-genomen-in-utrecht.html

2.1.15 Franprix en Seine: Shop deliveries using waterways in Paris

1. Basic information	
1.1) Identification	Franprix en Seine: Shop deliveries using waterways in Paris
1.2) Cluster	CL1 : City logistics
1.3) Responsible authors/	Christophe RIZET IFSTTAR

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classi-fication	The main partners are Franprix (a large retailer), Norbert Dentressangle (road carrier and transport organizer), Ports of Paris, VNF (Waterways of France), TDS (Handling on the Seine) - and SCAT (waterway carrier).
2.3) Geographical Area	This practice originates from Paris (France)
2.4) Implementa-tion status	To what extend is the solution implemented / in operation? Please indicate and explain. ☐ fully ☒ partly ☐ planned
	This type of deliveries might be extended to other Franprix stores in Paris
2.5) Date of im-plementation	This solution was implemented in 2012
2.6) Link to other clusters	• Are there existing connections to another cluster topic? no • Can there be future links to other cluster topics? no

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☒ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☒ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☒ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☐ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☒ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td></td><td></td></tr>
<tr><td>2.9) Supply chain elements</td><td>What other elements of the supply chain are involved in the practice?
A truck flow supplying Franprix stores located in the west side of Paris has been replaced by a multimodal transport chain in 3 legs: Pallets are loaded in specific boxes with a capacity of 18 pallets per box. These boxes are transported from Chennevières warehouse to the port of Bonneuil-sur-Marne (8 km) by road, transhipped in a barge (capacity 2000 t.) carried on the Seine river for approximately 20 km and transhipped again on a truck for the last km in town centre for final delivery to the stores.
The other elements involved are the platform in Chennevières, the two river ports (Bonneuil and ‘La Bourdonnais’) and the handling.</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☒ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☐ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☒ Image
☒ Increased safety and security
☐ Others</td></tr>
<tr><td colspan="2">For both actor groups:
☒ Limited climate change
☐ Reduced emissions
☒ Conservation of resources
☒ Others? Please specify: …energy, congestion and road safety savings</td></tr>
<tr><td colspan="2">Please specify all other and different targets here…</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☒ Reduced congestions *: minus 260 000 truck.km per year (and + 20 000 barge km on the waterways)* ☐ Reduced emissions : *according to TL&A report, emissions are raised* ☒ Reduced climate change : *minus 37 tonnes of CO2 /year* ☒ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☒ Other benefits: (please specify) : 14.000 litres of fuel saved per year
2.11) Level within innovation cycle	☐ Prototype tested, potential best practice to be followed within Bestfact ☐ Small scale trial under real business conditions, best practice under development ☒ Full developed best practice

3. Best practice	
3.1) Description of the practice	Please provide a description of the solution, give details about the **purpose** and the **sustainability objectives**. 80 Franprix stores, are supplied by a multi-modal transport chain in 3 legs: In the warehouse in Chennevières pallets are loaded in containers and transported to the port of Bonneuil-sur-Marne (8 km) by road. In Bonneuil the containers are transhipped in an inland vessel and carried on the waterway up to the river port of 'La Bourdonnais', near the Eiffel Tower (approximately 20 km) and transhipped again on a truck for the final delivery to the store located in the west of Paris. This multimodal organisation aims to reduce the impacts of the transport operations on the environment: road congestion in Paris, energy consumptions, GHG emissions, road noise and road accidents. A detailed assessment report has been published and both the shipper-retailer (Franprix) and the transport organiser (Norbert Dentressangle) communicate on this operation.

3.2) Technical main characteristics	What are the technical main characteristics? From 5 am till 11:30 am, 450 pallets of goods are prepared in the warehouse in Chennevières-sur-Marne then loaded in 26 containers specifically designed (18 pallets per box). Between 12 am and 6:30 pm, these containers are shuttled by truck to the Port of Bonneuil-sur-Marne. According to their arrival to the port of Bonneuil, containers are loaded on the barge by means of "Reach Stacker" and transported on the Waterway (Marne then Seine) from Bonneuil to the platform of La Bourdonnais in the 7th district of Paris, about 20 km away. There, containers are unloaded from the barge on the platform and loaded on trucks. These trucks supply stores located 4 km around the port of 'La Bourdonnais'. The stores are supplied between 6 am and 12:30 ; after deliveries, the empty containers are carried back to the barge and then to Bonneuil-sur-Marne by the river,to prepare the next load. Before this new organisation, the pallets were carried totally by road from the Chennevières warehouse. This truck flow has been partly replaced by a multimodal transport chain
3.3) Success factors	What are the main success factors of the practice? Why does it work so well?
3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • Financial benefits? • Economic benefits? • Benefits in the field of services? • Benefits for the society? • Environmental benefits, expressed in CO2 or CO2equivalent? • Other benefits? Please provide relatable measures, units and the relevant calculation base. Less road congestion inside Paris, less noise and less accidents (cf 5.2 here under)
3.5) Cost indication	If available, give indication of costs.
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed? An important limitation is the availability of platform on the Seine river inside Paris. This platform has been assessed to Franprix.
3.7) Common practice before implementation	Please specify what the common practice was before the implementation. Before the implementation, the stores were directly supplied by trucks from the warehouse in Chennevières.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice?
3.9) Justification of practice	Why can this case be considered a Best Practice? The main impact is road congestion mitigation and all the advantages linked.

4. Transferability

4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)? Availability of a waterway platform in the city center
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Please give a reason for your evaluation Other shippers are using waterways in Paris.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☐ No
	Please give a reason for your evaluation
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☐ Yes ☒ No
	This practice can be used in other areas where waterways are available.
4.5) Similar cases	Are there existing similar cases? If so please indicate and specify what sets this case apart and makes it a better practice. In this case, the goods are transported on the river up to the town centre.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Please give reasons why this case should be (or should not be) considered for in-depth review. Data availability is low.
5.2) References	References and sources used to provide the given information TL&A report : Evaluation environnementale d'une solution de report modal pour la livraison urbaine dans Paris, Norbert Dentressangle, 2012 , 32 p. + annexes http://www.franprix-entre-en-seine.fr/accueil.html
5.3) Contact for further details	If personal contacts were established please provide the name, email and telephone number
5.4) Date of review	Latest date of update of this format (06/03/2013)

5.5) Pictures

Figure 13: Paris retail deliveries by inland waterways

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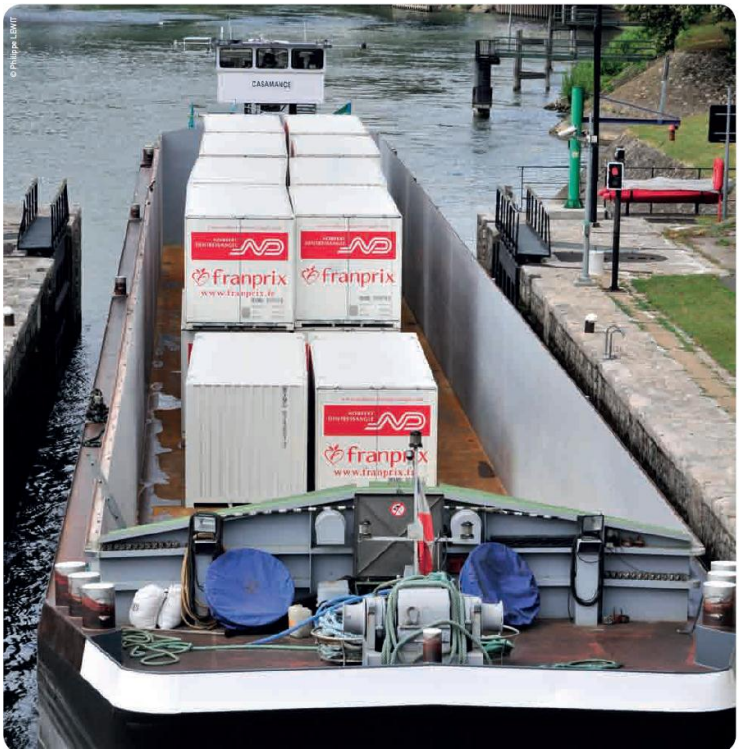
Figure 14: Use of small containers for boat load



2.2 In-depth reviews

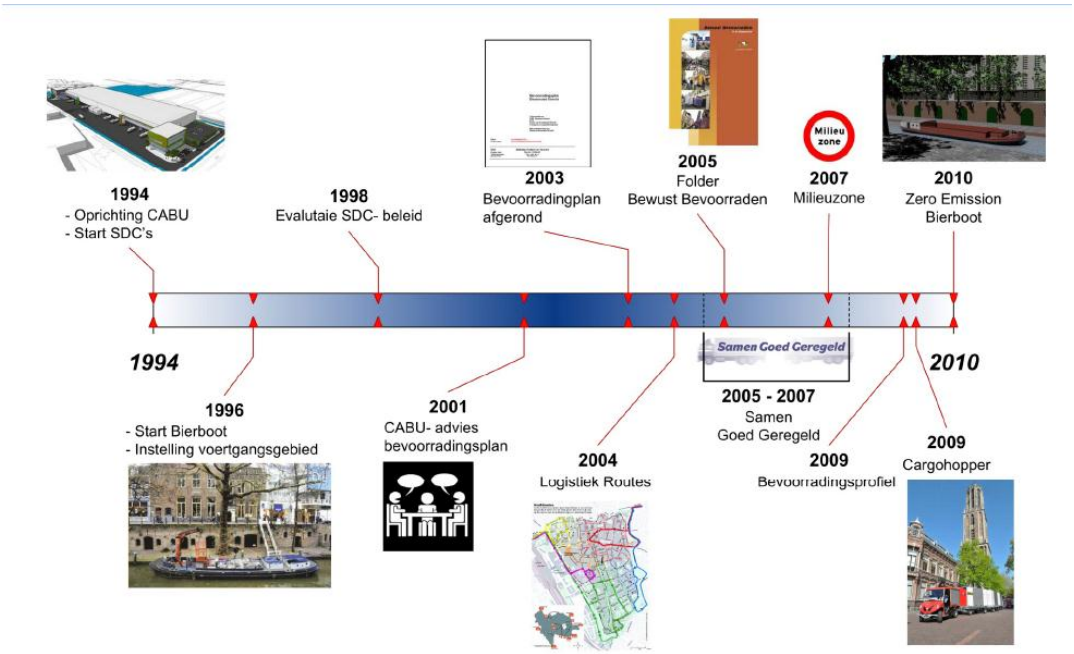
2.2.1 Practices from Utrecht

Introduction

In this case, instead of describing just one practice, two measures are presented which are part of a broad policy package: the new zero emission boat and the Cargohopper. These measures have been implemented in the municipality of Utrecht in order to improve the efficiency of the city logistics, decrease the congestion and other negative externalities of freight transport (emissions, noise).

From 2003 and on, the city of Utrecht has introduced a series of measures and structured a urban freight policy package (Figure 4 shows some examples: access restriction schemes, distribution centres, logistics routes, etc.)[1]. Two of the most recent practices introduced in Utrecht are the Cargohopper (2009) and the new Zero Emission Boat (2010). The following sections will describe these two good practices in more detail.

Figure 15: Measures Utrecht has taken on urban distribution



Source: Presentation Buck Consultants International 2010

1. Basic information	
1.1) Identification	Zero Emission Boat [ZEB] or electric Beer Boat, Utrecht, Netherlands Cargohopper [CARGOHOPPER], Utrecht, Netherlands
1.2) Cluster	Cluster 1, urban freight
1.3) Responsible authors/	Panteia

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	[ZEB] Implementation/ funding: the municipal department of public works (SW) of Utrecht. The Beer Boat is used by 4 different brewers, 1 catering industry wholesaler and 65 clients, who cover the operational costs. [CARGOHOPPER] The solution was implemented by Hoek transport [2]. Other involved actors are: the Municipality of Utrecht. Among the end-users one can find local retailers and companies
2.3) Geographical Area	Both practices are implemented in the Municipality of Utrecht, The Netherlands
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	Both solutions are fully implemented. ZEB: The first Beer Boat started to operate in 1996. The new electric ZEB started working in 2010. In 2012, a new boat is expected (larger for heavier cargo). The CARGOHOPPER is active since 2009. A new Cargohopper (II) was implemented in 2011. In 2012, a new pilot started with the Cargohopper for the delivery of goods to the hotel, restaurant and catering sector in Utrecht. One Cargohopper was adapted to be able to carry fresh/frozen goods. The distribution centre used for the Cargohopper has also been adapted to be able to store these temperature sensitive goods.
2.5) Date of implementation	ZEB: since 2010 CARGOHOPPER: since 2009
2.6) Link to other clusters	Possibly to e-Freight (efficient delivery system based on the needs (ZEB) and last mile operations – cargohopper)

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☒ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☐ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☒ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes ZEB, CARGOHOPPER

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☐ Road/ truck ☐ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☒ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …

ZEB, CARGOHOPPER</td></tr>
<tr><td>2.9) Supply chain elements</td><td>[ZEB] Suppliers, carriers, clients
[CARGOHOPPER] Suppliers (distribution centres), end-users</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others

For private actors:
☐ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☒ Increased competitiveness
☐ Increased quality
☐ Image
☐ Increased safety and security
☐ Others

For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …

ZEB, CARGOHOPPER, Both
[CARGOHOPPER] the Cargohopper can also be used as a ‘public announcer’ as there is space on both sides of the vehicle for advertisements</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☐ Quality of services ☒ Reduced congestions ☒ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☐ High level of acceptance of solution/practice ☒ Other benefits: (deliveries outside the road vehicle restriction scheme, increased safety, attractive city centre)… ZEB, CARGOHOPPER, Both

3. Best practice	
3.1) Description of the practice	Two practices were introduced since 2009, in the city of Utrecht in order to further improve the 'green' logistic operations of the city: the ZEB and the CARGOHOPPER [ZEB] The delivery from 4 breweries and 1 catering industry to 65 clients along the canals of Utrecht is performed via an electric zero emission boat. In the future, a new larger boat will be also used also for picking up garbage. [CARGOHOPPER] The Cargohopper is a multi trailer, 16-metre long yet narrow, solar powered road train riding on pneumatic tires. The Cargohopper is used to deliver parcels in Utrecht's inner city quarters. It is designed for the delivery of packages (not for pallets). The three containers are in fact separate boxes that can be loaded on and off the undercarriages by a forklift. Eight of those boxes fit on a European sized trailer of 13.60 meters.

3.2) Technical main characteristics	[ZEB] The electric Beer Boat uses green energy and can be used 8-9 hours on one charge. Cargo specifications: 1. 40-48 containers 2. Cargo load: 18 tonnes 3. Electric hydraulic crane 4. Length: 18.80 metres 5. Width: 4.26 metres Technical specifications: 6. Propellor drive: 400-V AC electric motor of 55kW 7. Batteries are charged during nightitme 8. 12kW bow thruster 9. 4 sets batteries supplying 480V DC [CARGOHOPPER] The Cargohopper is a vehicle that is able to tow 3 metric tons in a line (16 meters) with a 48 Volt 28 hp electric engine. Its maximum speed is 20 km per hour, but that is more than enough as it is only driving in the inner city of Utrecht and does not make more mileage than a maximum of 60 kilometres per day. The Cargohopper can also collect dry cardboard, paper and empty packaging from shops for recycling, so it never has to run empty. The Cargohopper is able to make 3 complete round trips a day, which means that it can do the work of 5 to 8 regular (European sized) delivery vans (e.g. Mercedes-Benz Sprinter). The Cargohopper has zero emissions (3 solar panels on top of the lorries) and is allowed in the inner city at any time and any place. That is part of the advantage. It is also quite narrow: only 1.25 meters wide so when it stops to make a delivery in narrow streets, most of the other traffic is able to pass. The new cargohopper (II) is a 9m long vehicle and 1.75m wide and is able to transport 10 Euro pallets or their equivalent in roll containers. It covers a range of 200km at a maximum speed of 60km per hour.

3.3) Success factors	[**ZEB**] 1. Cost efficient, time-efficient (not dependent on time windows) 2. Reducing almost 17 tonnes of CO2 annually 3. Preservation of the bridges and roads of Utrecht 4. Publicly owned (small private costs) [**CARGOHOPPER**] This practice show that sustainable freight transport (less vkm, energy consumption and emissions) can be done in a profitable way, without financial support form the community. The two measures demonstrate different aspects of success, especially with regard to their financing part. However, they are both cost efficient and time efficient (as they can move outside the access restriction scheme). They are also very well accepted because they improve the quality of life in the centre of Utrecht.
3.4) Main benefits	[**ZEB**] Techno-economic benefits: No two-tons axis load restrictions No time windows No one-way traffic Less congestion, less CO2/NOx emissions [**CARGOHOPPER**] Energy efficient, sustainable solution (in terms of environmental impacts and also operating costs)
3.5) Cost indication	[**ZEB**] Not available [**CARGOHOPPER**] The initial investment of Cargohopper (to get on road) exceeded the originally estimated amount of 150,000€ by at least 20%. The introduction of the new Cargohopper (II) was partly financed with the contribution obtained with the Urban Distribution Award won in the Netherlands in 2009.
3.6) Barriers / Limitations	[**ZEB**] Technical limitations of the vehicle (sorted by scheduling) Financial barriers (investment costs) No clear business model for implementing the solution in other locations [**CARGOHOPPER**] the disadvantages of cargohopper are the limited range (in km) and the low speed. As the Hoek City Distribution Centre was 11 km from the city an extra transfer point was created to tackle with these issues.
3.7) Common practice before implementation	Transportation by trucks/ vans in specific timeframes (and as last mile operation in the case of Cargohopper).

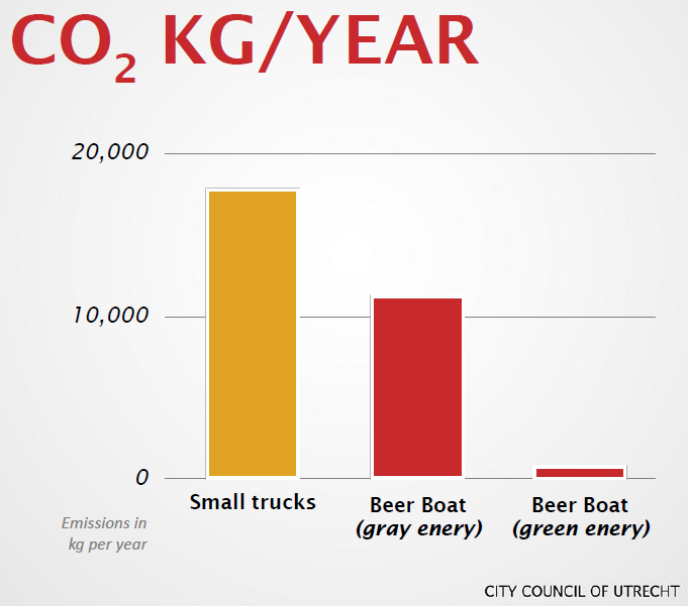
3.8) Motivation/problem	1. Decrease road goods traffic in the city centre [Both]; and 2. Make better use of the potential for waterborne transport for supplying the city [**ZEB**]. 3. Improve last mile operations without a specific timeframe [**CARGOHOPPER**]
3.9) Justification of practice	Convenient solution for urban transport, environmental benefits, easy to transfer to similar natural environments. In the case of Cargohopper, this solution can be implemented also without (strong) governmental support, i.e. public funds. In addition, both solutions are operationally viable.

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Depending on natural infrastructure for ZEB
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	Perhaps, vehicle safety regulations [ZEB] Technical limitations of the vehicle [CARGOHOPPER]
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	[ZEB] The solution is already mentioned that other Dutch cities (such as Amsterdam, Gouda or Woerden) would like to engage this solution. However, its extensibility depends on several issues like infrastructure (waterborne network), the cost efficiency of the cosultion etc. [CARGOHOPPER] In this case the solution can be extended, always taking into consideration the limited vehicle range and its low speed.
4.5) Similar cases	The ZEB solution is implemented also in Amsterdam (Mokum Mariteam). Gouda and Woerden also plan to use this solution.

5. Additional information	
5.1) Consid-eration for in-depth analy-sis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Innovative, transferable, sustainable solutions
5.2) Refer-ences	References included in the end of the document
5.3) Contact for further details	(Panteia)
5.4) Date of review	Version 0.1: 19-10-2012

5.5) Pictures	 Source: http://www.stichtingmilieunet.nl/andersbekekenblog/openbaar-vervoer/elektrische-zero-emission-bierboot-in-de-vaart-genomen-in-utrecht.html  Source: http://www.cargohopper.nl/files/67081240331536CargohopperBRO252a.jpg

6. In-depth information

6.1) Costs	For the **ZEB** there is no investment cost indication. Regarding the operations costs, the ZEB [3] is rented per hour with 85€. Its roundtrip per day is estimated at 6 hours. For the **CARGOHOPPER** the original investment was 150,000€ (exceeded by more than 20%). Cargohopper II (from Hoek Transport) was financed partly with the contribution obtained with the Urban Distribution Award won in the Netherlands in 2009. This award provided 250,000 Euro's, which was divided with two other stakeholders: as the Municipality of Utrecht and GEPU (a hotel and catering whole sale company). **Cost estimates [5]** Buck Consultants International and Goudappel Coffeng BV performed an analysis on costs of applying Low Emission Zones – LEZ- technologies such as the beer boat. They have divided the costs in research and process costs (estimation of 100,000€), implementation costs (for pure manual mechanism 80,000€; however, also mentioned costs of this phase are: communication and signing – 40,000€, law enforcement infrastructure -40,00o€. Finally, these costs depend on the implemented units and the adaptation of infrastructure) and operational costs (75,000€ per year).
6.2) Benefits / Strengths	**ZEB** **Figure 16: Benefits of Zero Emission Boat for CO2 emissions [4]**  **Figure 17: Benefits for PM10 [4]**

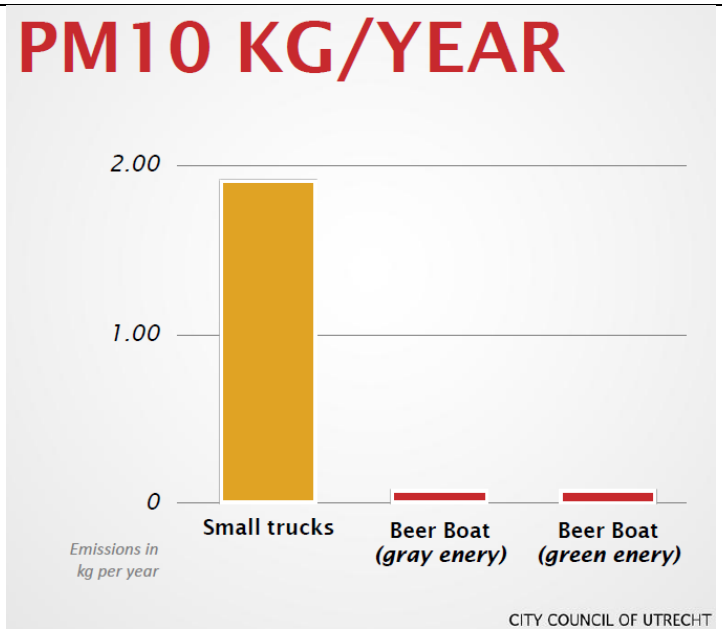
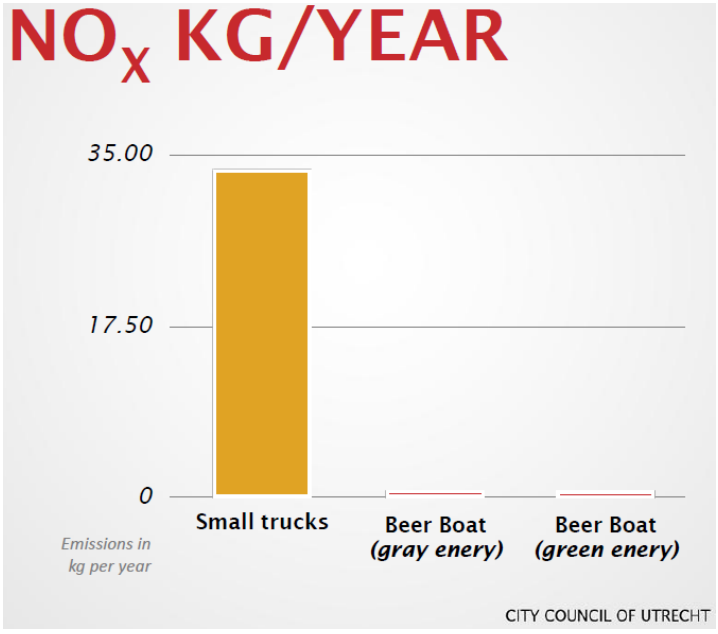


Figure 18: Benefits for NOx [4]



Information on the Zero Emission Boat also identified the NPV values [3]. The economic benefit is calculated in accordance with the HEATCO guidelines (HEATCO, 2006) and the results for both scenarios up to 2024 are as follows: for two scenario (high and low, with the low assuming no increase in the number of trips) the presented net present value is positive, but the span lies between 100,000 Euros and 4.2 Million Euros.

Figure 19: Benefits of the ZEB according to different scenarios

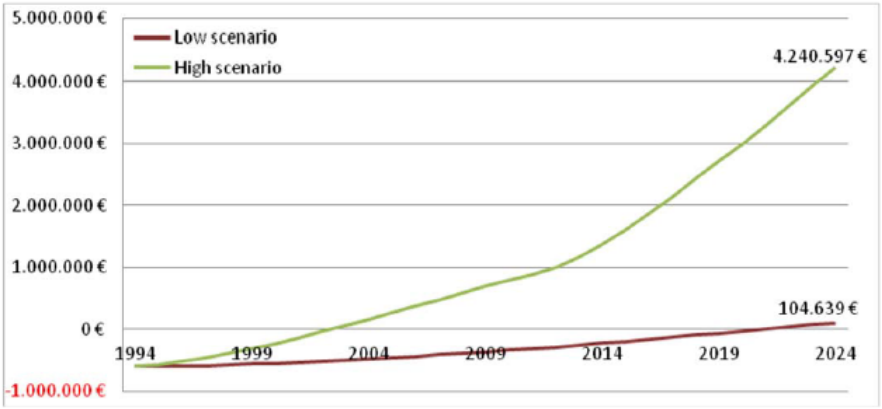


Figure 5: Cumulative net present values for the different scenarios (Hogenberg, 2012)

The [5] study also mentions categories of benefits from LEZ technologies:

Cleaner air

- Incentive to innovate for companies (new concepts of urban logistics)
- Health impacts
- Comply with the European emission maxima
- Cost savings from LEZ technologies could be up to 1.5-3 million € from operational costs (depending on the case)

CARGOHOPPER

Results for Cargohopper 1 show an:

- An economic saving of roughly 5,200 gallons of diesel annually by taking conventional vehicles off the streets.
- Cargohopper removes up to 100.000 van kilometres from the inner city streets (transporting from and to the Distribution centre) [7]
- An environmental benefit of roughly 33 tons of CO2-savings per year by swapping fossil-fuel powered vehicles for solar-powered ones. [6]. Cargohopper II uses new solar panels; if Cargohopper II is functional for an average distance of 175 km/day this could reach up to 80 tons of CO2 savings.

<table>
<tr><td>6.3) Weaknesses</td><td colspan="3">Technical weaknesses:
Range and speed (maximum 60km/h) for the CARGOHOPPER
Infrastructure for the ZEB
Market weaknesses
The high costs of ZEB combined to its functionality aspects (specific cargo for specific areas) can limit its marketability. For example, in the Netherlands, due to access restriction schemes or other issues (in the case of Utrecht strict axis load restrictions), it was very easy to adopt the ZEB solution. However, in other cities this type of ‘mental shift’ is not necessary and they prefer a more cost-efficient solution.</td></tr>
<tr><td rowspan="3">6.4) Implementation steps</td><td colspan="3">What are the different actions necessary in the implementation steps and how long does each step take (estimates)?</td></tr>
<tr><td>1. Preparation: …</td><td>2. Implementation: …</td><td>3. Operation: …</td></tr>
<tr><td colspan="3">ZEB
The first Beer Boat started operating 1996. The new electric ZEB started working in 2010. In 2012, a new boat is expected (larger for heavier cargo).
Cargohopper
The implementation of the Cargohopper project (by the private transport company – Hoek) lasted only four months.</td></tr>
<tr><td>6.5) Process</td><td colspan="3">Both of the solutions targeted the urban freight issues in the centre of Utrecht: congestion, length restriction, time windows and the environmental zone. Hence the motive behind their implementation was the same.
The two solutions differ in the first two steps of the process. The first is solely the project of public funds (ZEB), while the second was designed and introduced by the private transport company Hoek. The operation step is similar for the two solutions: they transport products for industries and services (retailers): the first by being leased to them by the municipality and the second by serving them directly (by Hoek transport). Their annual income supports their basic operational and maintenance costs. In the case of ZEB, the boat extra costs are paid by the municipality (e.g. electric propulsion and equipment).
Especially in the case of Cargohopper, it is evident that the solution is very cost efficient and with significant environmental benefits (and cost savings from decreasing fuel consumption).</td></tr>
</table>

6.6) Technical feasibility	Both solutions have been deployed and were very successful in the case of Utrecht. In fact, due to the wide acceptance and efficiency of these solutions, they were redeveloped and expanded (second ZEB in Utrecht and Cargohopper II). In order to transfer the solution, it is necessary for the **ZEB**: 1. To have access to a waterways network 2. To equip a ship with a crane on board to be able to load and unload without quayside facilities [6] 3. To consider implementation costs For the **Cargohopper**, it is important to consider the speed limit and the maximum daily travelled distance. In both cases a successful business plan is importance in order to ensure enough revenues for the viability of the projects.

Radar charts

Following radar charts summarise the importance of BESTFACT targets for the Utrecht cases presented.

Figure 20: Radar chart on importance of private targets for ZEB and Cargohopper

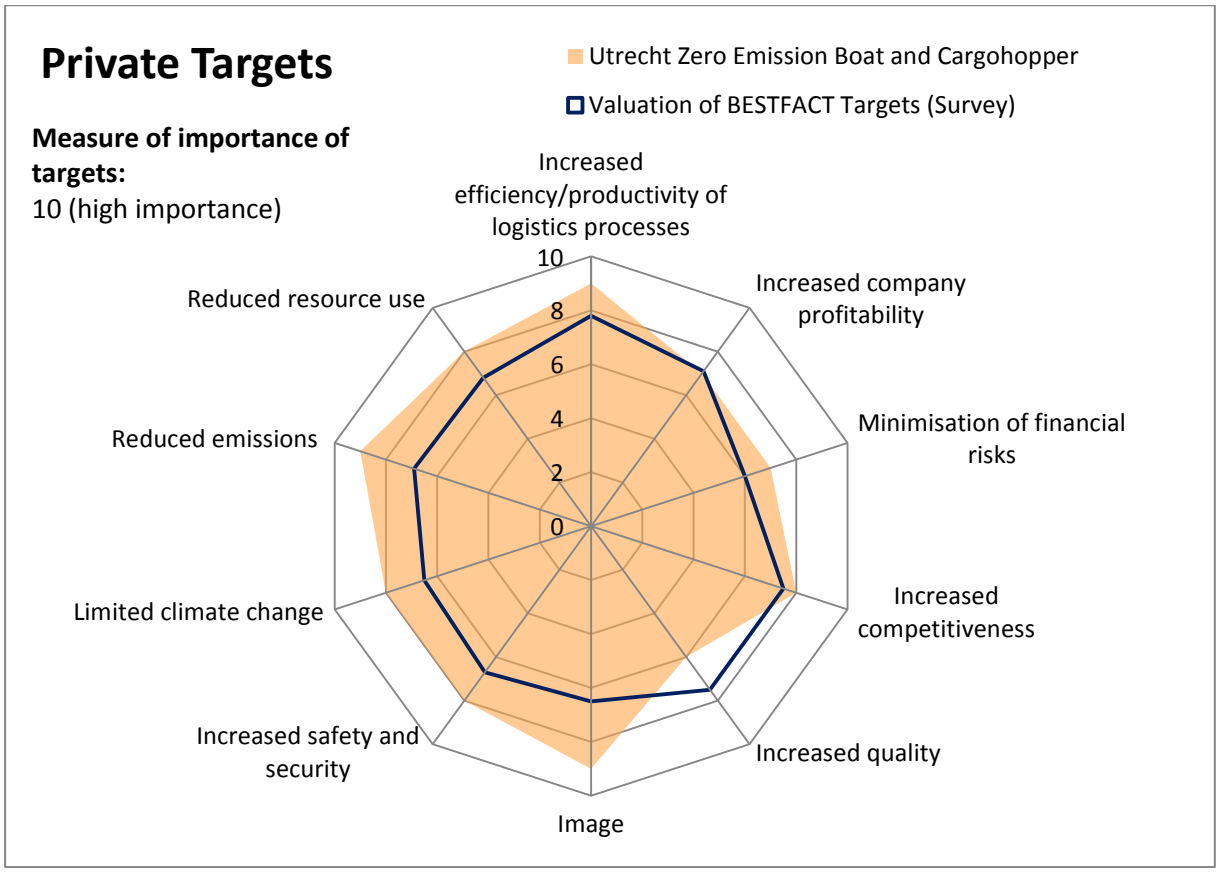
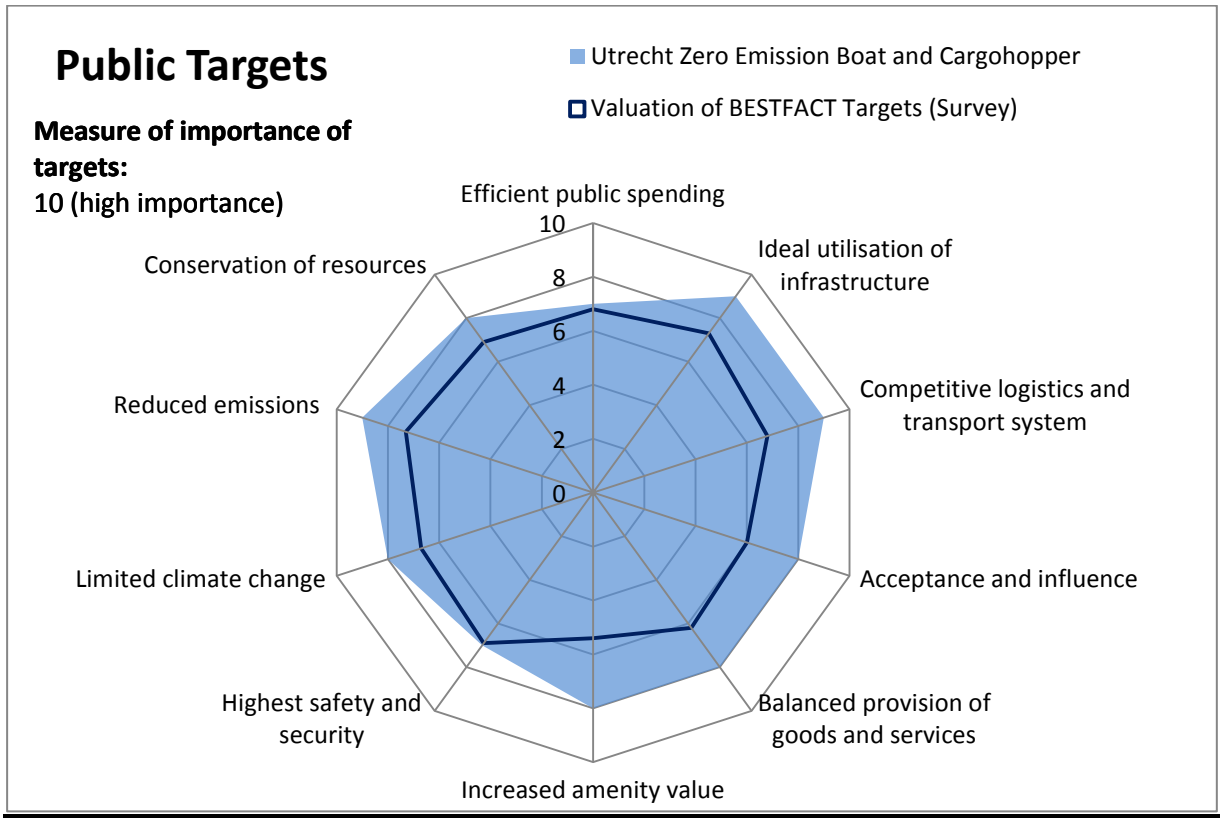


Figure 21: Radar chart on importance of public sector targets for ZEB and Cargohopper implementation



Sources:

[1] TURBLOG report for Utrecht

[2] http://www.hoektransport.nl/

[3] https://www.verkehrsplanung.tu-berlin.de/fileadmin/fg93/Forschung/Projekte/MIMOSA/Riedel_Dziekan_BCA_Experiences_from_CIVITAS_PLUS.pdf

[4] http://www.inlandnavigation.org/uploads/public_documents/beerboat.pdf

[5] Platina project, European Good Practices Report for Inland Waterway Transport, 2011

[6] http://www.civitas.eu/index.php?id=138&news_id=1451

[7] http://www.go-green.ae/greenstory_view.php?storyid=1819

2.2.2 Electric tricycle and vehicle use in retail distribution in London

1. Basic information	
1.1) Identification	Gnewt Cargocycle and electric vehicle use in retail distribution
1.2) Cluster	1 (clean vehicles and consolidation) 2 (green logistics)
1.3) Responsible authors/	Jacques Leonardi, University of Westminster

2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Retail, freight operator, local authority.
2.3) Geographical Area	UK, London
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	100% battery electric powered fleet is in operation since May 2010.
2.5) Date of implementation	Starting with the creation of the start-up company Gnewt Cargo in 2009
2.6) Link to other clusters	• Cluster 1 Use of clean (electric) vehicles linked with Use of Consolidation Centre; Cluster 2 Use of clean vehicles • Cluster 3 methodology for assessment of costs and benefits, and CO2 impacts of the solution

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☐ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☒ Implementation of low emission technologies ☐ IT-technologies and solutions (for management and administration) ☒ Innovative vehicles, vessels and equipment ☐ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☐ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☐ Innovative operational solutions ☐ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☐ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☒ Monitoring and benchmarking of processes

<table>
<tr><td rowspan="2">2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☒ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td>Before: 100% diesel vans; after: 100% battery electric vehicles: Cargo-cycles and small electric vans</td></tr>
<tr><td>2.9) Supply chain elements</td><td>Additional small consolidation centre close to the delivery area. High density of customers in the delivery area.</td></tr>
<tr><td rowspan="3">2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
☒ Image
☐ Increased safety and security
☒ Others: Social entrepreneurship</td></tr>
<tr><td colspan="2">For both actor groups:
☒ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td colspan="2">Creation of a new company with job creation and employment effects.</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☒ Quality of services ☐ Reduced congestions ☒ Reduced emissions ☒ Reduced climate change ☒ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…

3. Best practice	
3.1) Description of the practice	A new urban consolidation centre was established close to the Tower of London in the City of London. This consolidation centre was used as a transhipment facility for the transfer of parcels from the suburban depot onto electric vans and tricycles and for overnight storage of the electric vans and tricycles. Because the centre itself was small (approximately 20 metres by 8 metres) it was referred to as an "urban micro-consolidation centre". The urban micro-consolidation centre and the deliveries made from it were operated by the new company specialising in green urban freight deliveries, on behalf of the office supplies company. An 18-tonne goods vehicle was used to transport parcels from the office supplies company's warehouse in the suburbs of London to the micro-consolidation centre in the City of London (a distance of 30 kilometres – only 1 kilometre of which was in the City of London). The delivery was made overnight from the office supplies company's suburban warehouse to the consolidation centre in the City of London. Electrically-assisted cargo tricycles and electric vans were used to make parcel deliveries from the urban micro-consolidation centre to customers in the City of London. The operation of these vehicles did not result in any fossil fuel consumption or greenhouse gas emissions as the electricity they used was produced from renewable sources. In the initial stages of the trial heavier, bulkier products than parcels continued to be delivered directly by the office supplies company to customers using diesel-powered vans from the suburban depot (in the same way as before the trial). However by the end of the trial diesel van deliveries from the suburban depot had ceased and all deliveries were made via the micro-consolidation centre using and electric vans and tricycles.

3.2) Technical main characteristics	The electrically-assisted cargo tricycles (Figure 22) were manufactured in France by La Petite Reine. The empty weight of the tricycle is 110 kg, including the two batteries (i.e. without the driver and load weight). It can carry a load of up to 180 kg and has a load space of 1.5 cubic metres. It is 2.35 metres long and 1.03 metres wide and has a typical speed of approximately 15 kilometres per hour in free-flow conditions. The tricycle requires a four-hour recharging overnight. Aixam Mega electric vans were used in the trial. They had a load capacity of 445 kg and a load space volume of 3 cubic metres. Their external length was 3.32 metres and their width external was 1.49 metres. The vans require an overnight recharging. Figure 23 shows one of the electric vans used.
3.3) Success factors	Creation of a new company supported by the retailer. Positive support from the local authorities.

3.4) Main benefits

Following Table shows a comparison of the distance travelled and greenhouse gas emissions before and during the use of electric vehicles.

	Before use (Oct 2009)	***During use (July 2010)***
Fleet mix used	No micro-consolidation centre - 7 diesel vans only	Micro-consolidation centre - 0 diesel vans, 6 tricycles, 3 electric vans, 1 diesel truck
Distance travelled in the City of London		
Kilometres per parcel	0.06	0.27
Change compared with before trial	-	***349%***
Distance travelled rest of London		
Kilometres per parcel	0.36	0.07
Change compared with before trial	-	***-82%***
Distance travelled in all of London		
Kilometres per parcel	0.41	0.33
Change compared with before trial	-	***-20%***
CO_2e emissions in City of London		
CO_2e per parcel (kg)	0.020	0.003
Change compared with before trial	-	***-83%***
CO_2e emissions in rest of London		
CO_2e per parcel (kg)	0.122	0.062
Change compared with before trial	-	***-49%***
CO_2e emissions in entire system		
CO_2e per parcel (kg)	0.142	0.065
Change compared with before trial	-	***-54%***

Source: University of Westminster survey 2009-2010

Note: CO2e – carbon dioxide equivalent which includes carbon dioxide, nitrous oxides and methane.

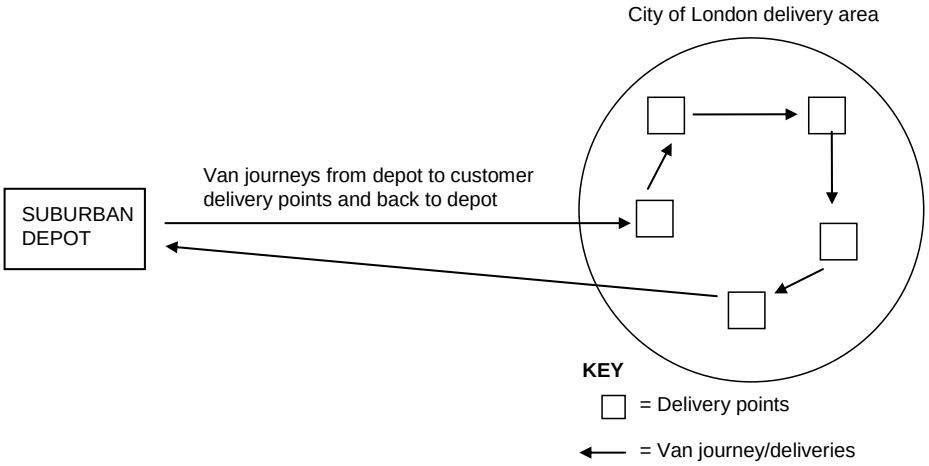
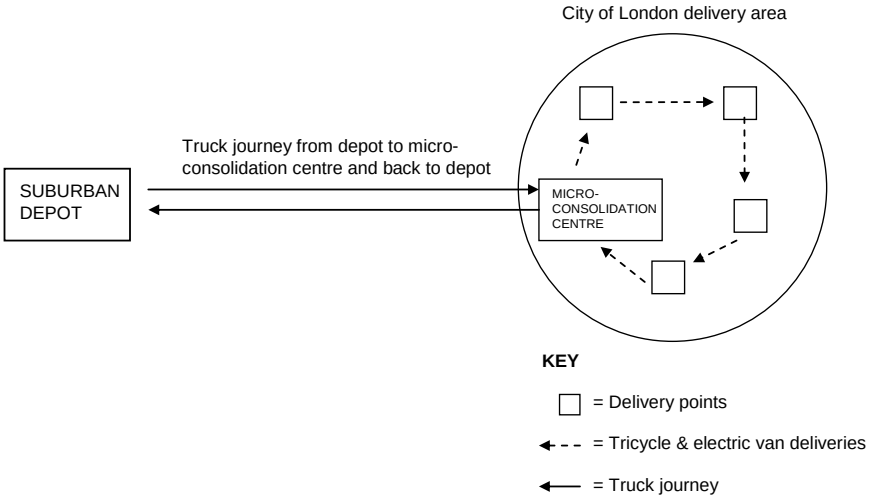
The results in Table 3 show that by May 2010 the use of the micro-consolidation centre together with the complete replacement of the diesel van fleet by electric vans and tricycles led to a reduction of 20% in the total distance driven by all vehicles per parcel delivered between the suburban depot and the customer delivery locations. The total CO_2 equivalent (CO_2eq) emissions per parcel delivered was 54% lower in May 2010 than in October 2009 before the trial. This was due to the reduction in the total distance travelled per parcel and the use of electric vehicles using fuel generated from renewable, carbon-free sources in the City of London.

3.5) Cost indication

Profitability was given 3 months after company started the new fleet

3.6) Barriers / Limitations

See above

3.7) Common practice before implementation	Following Figure describes the logistics system for deliveries by diesel vans from the suburban depot before the project starts.  The next Figure shows the logistics system for deliveries by tricycles and electric vans via the micro-consolidation centre 
3.8) Motivation/problem	Air quality, noise and image problems of the freight transport in central London.
3.9) Justification of practice	Because this company was the first to use this type of vehicles in UK

4. Transferability

4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Registration of the Cargocycles for road traffic.

4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The goods need to be of high density. The density of customers in a small area needs to be high. The town should not have big hills or steep terrain. The vehicle type has to be accepted for road usage by the country road authorities. The main barrier for a potential future client will be to change its usual, established customer and delivery relationships.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	Authorisation of the vehicle type for road usage
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No
	No barrier identified
4.5) Similar cases	French case of La Petite Reine. Bilbao. Other cycle freight projects and electric vehicle projects in Europe are used for retail deliveries.

5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Available data, high transferability, political implications
5.2) References	Michael Browne*, Julian Allen and Jacques Leonardi (2011): Evaluating the use of an urban consolidation centre and electric vehicles in central London. IATSS RESEARCH Vol. 35, No. 1 (Spring 2011) Special Feature on "Logistics Systems and the Environment" Leonardi J., Browne M. and Allen J. (2012): Before-after assessment of a logistics trial with clean urban freight vehicles: a case study in London; Seventh International Conference on City Logistics which was held on June 7- 9, 2011, Mallorca, Spain, Procedia - Social and Behavioral Sciences, Volume 39, 146–157. http://dx.doi.org/10.1016/j.sbspro.2012.03.097
5.3) Contact for further details	Jacques Leonardi j.leonardi@westminster.ac.uk Matthew Linnecar, Gnewt Cargo, London, http://gnewtcargo.co.uk/

5.4) Date of review	November 2012
5.5) Pictures	 **Figure 22: Cargocycle vehicle**  **Figure 23: Electric van**

6. In-depth information	
6.1) Costs	• The costs for one new Cargocycle vehicle was about 9,000 Euro • The electricity provider sales his green electricity at a slightly higher price than the main electricity provider in UK • The service pricing is identical to the usual market price for parcels deliveries • There is a long term contract between the partners • Positive profit margin realised after 3 months of running the business • No direct public sector subvention was received by the company

6.2) Benefits / Strengths

ANALYSIS OF THE BEFORE AND AFTER SITUATION

Comparing vehicle weight and volume attributes

Table 2 shows the weight and volume capacity attributes of the three vehicles used to deliver parcels. The diesel van has the greatest weight and volume capacity, and the tricycle the least. The volume to weight ratio indicates that the diesel van is capable of carrying slightly more weight per unit of volume than the electric van and approximately 30% more than the tricycle. The diesel van is therefore better suited to carrying goods with high bulk density. It would simultaneously reach its volume and weight capacity limits when carrying goods with a bulk density of 160 kg/m3 whereas the tricycle would reach this limit with goods with a bulk density of 120 kg/m3.

Table 2: Volume and weight attributes of vehicles used before and during the trial

	Diesel van	Tricycle	Electric van
Weight capacity (tonnes)	1.4	0.18	0.45
Weight capacity index (diesel van = 100)	100	13	32
Volume capacity (cubic metres)	9	1.5	3
Volume capacity index (diesel van = 100)	100	17	33
Volume to weight ratio (tonnes per m^3)	0.16	0.12	0.15

The survey work has found that the average parcel handled by the office supplies company for delivery in the City of London has a weight of 5.65 kg and a volume of 0.0375 m^3. This means that the average parcel has a bulk density of approximately 150 kg/m^3, and this bulk density is more suited to the electric and diesel van than the tricycle in terms of maximizing the load carried on each vehicle. When carrying parcels with this average bulk density the tricycle will reach its weight limits before being fully loaded in terms of volume. By comparison the electric van is fully loaded in terms of both weight and volume when carrying parcels with this average bulk density. The diesel van will reach its volume limits before being fully loaded in weight terms.

Comparing operational data before and during the trial

Table 3 provides data of the vehicle operations before and during the trial. It compares the diesel van operation from the suburban depot to customers in the City of London (i.e. before the trial) with the electrically-assisted tricycle and electric van delivery operations from the urban micro-consolidation centre to customers in the City of London. These results are based on detailed surveys and observations of the journeys. The diesel van carried a far greater load than either the electric van or tricycle and delivered more parcels per stop. As the diesel van operates from a suburban London depot this has implications for the proportion of total journey time spent travelling between stops and stopped while making deliveries. The operation of the tricycle and electric van resulted in no fossil fuel consumption or greenhouse gas emissions as the electricity they use has been produced from renewable sources.

6.2) Benefits / Strengths (continue)

Table 3: Data from the observed operations before and during the trial

Operational features	Before trial (trunking & deliveries)	During trial (deliveries from UCC only)	
	Diesel van	Tricycle	Electric van
Deliveries per journey			
Number of stops to make deliveries	20	17	14
Number of parcels delivered during journey	168	33	42
Parcels delivered per stop	8.4	2.0	3.0
Time use (as % of total journey time)			
"Stem" driving time from depot to first stop	21%	10%	12%
Time running on the road between first and last stop	21%	28%	26%
Time unloading between first and last stop	48%	54%	52%
"Stem" driving time from last stop to depot	10%	9%	10%
Total journey time (hours and minutes)	03:41	02:42	02:15
Driving speed			
Average driving speed in the City of London (km per hour)	8	8	8

Source: own survey 2009-2010

Distance travelled and greenhouse gas emissions

The results show that by May 2010 the use of the micro-consolidation centre together with the complete replacement of the diesel van fleet by electrically-assisted tricycles and electric vans led to a reduction of 20% in the total distance driven by all vehicles per parcel delivered between the suburban depot and the customer delivery locations. The total carbon dioxide equivalent (CO_2e) emissions were calculated for the delivery system before the trial (CO_2e includes carbon dioxide, nitrous oxides and methane emissions). The total CO_2e emissions per parcel delivered was 54% lower in May 2010 than in October 2009 before the trial. This was due to the reduction in the total distance travelled per parcel and the use of electric vehicles using fuel generated from renewable, carbon-free sources in the City of London.

The distance travelled between the suburban depot and the City of London per parcel delivered fell by 82% due to the use of a single truck to transport goods between the suburban depot and the micro-consolidation centre in the City of London. However, within the City of London the total distance travelled per parcel delivered increased by 349% by May 2010. This is due to the lower carrying capacity of the electric vans and tricycles compared to the diesel vans together with the guaranteed delivery times that have to be met, thereby resulting in the need for more delivery activity per day. In terms of CO_2e emissions, these fell by 49% per parcel delivered between the suburban depot and the City of London, and by 83% per parcel delivered within the City of London compared with the situation before the trial.

6.2) Benefits / Strengths (continue)

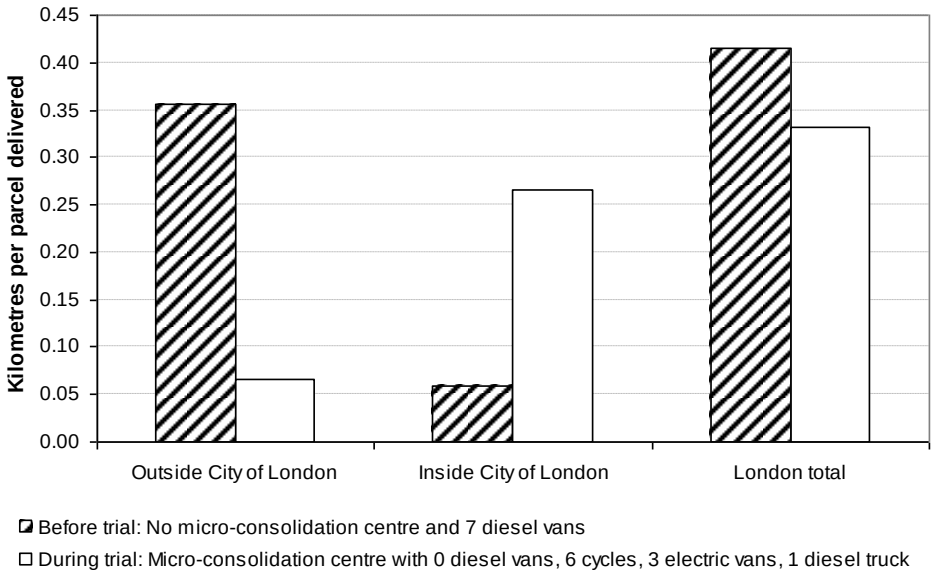


Figure 24: Distance travelled per parcel before, and during the trial

Figure 14 shows the results in terms of distance travelled per parcel, while Figure 15 shows the results in terms of CO_2e emissions per parcel. Both of these figures show the results in the City of London where the deliveries are made, in the rest of London (as the parcels are transported from the suburban London depot to the City of London), and in London as a whole (i.e. the sum of both of these activities). The results indicate the improvements in total distance travelled and CO_2e emissions per parcel, and the reduction in the distance travelled per parcel in the rest of London when the operation using a micro-consolidation centre and only electric vehicles. The results also highlight the increase in the distance travelled per parcel and the reduction in CO_2e emissions per parcel within the City of London delivery area as a result of this new distribution system.

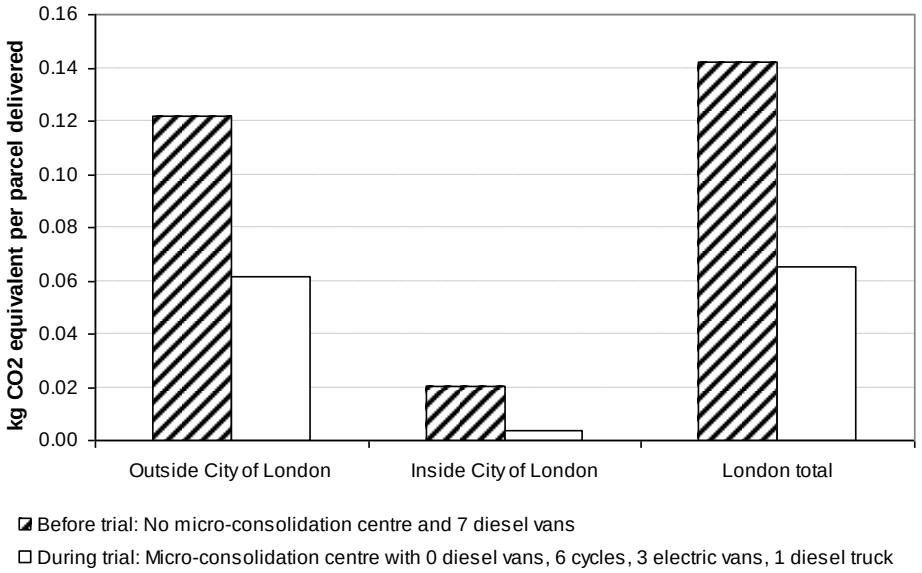


Figure 25: CO_2 equivalent emissions per parcel before, and during the trial

<table>
<tr><td>6.2) Benefits / Strengths (continue)</td><td colspan="3">CONCLUSION

This in-depth survey on costs, benefits and strengths has considered the use of cycles for urban freight transport and how they can be utilised effectively within commercial supply chains. One method by which this can be achieved is by implementing a urban micro-consolidation centre within the target delivery area and trunking goods to this centre at which they can be cross-docked onto cycles for final delivery. In the trial evaluated in this paper which utilises these techniques (i.e. electrically-assisted cycles and urban micro-consolidation centre – as well as electric vans) the total distance travelled and the CO_2e emissions per parcel delivered fell by 20% and 55% respectively as a result of this delivery system.

However, the evaluation has also indicated that the distance travelled per parcel rose substantially in the City of London delivery area as a result of the electric vehicles having far smaller load limits in both weight and volume compared with diesel vans. But, at the same time, the trial system was able to virtually eliminate CO_2e emissions per parcel delivered in the City of London. The results therefore reflect the trade-off between total distance travelled and greenhouse gas emissions associated with the use of clean electric vehicles in place of diesel vehicles that have greater size and volume payloads.</td></tr>
<tr><td>6.3) Weaknesses</td><td colspan="3">The negative impacts on mileage within the city of London is the main weakness of the Cargocycle, so it needs to be completed by small electric vans.

One major constraint is the very small capacity compared to usual vans, making Cargocycles only suitable for deliveries of small parcels

Another constraint is the short total distance per day, making this business sensitive to getting a high density of clients in the delivery area.

Finally, the constraint of using a city centre transhipment/distribution depot is depending on the availability of affordable space.</td></tr>
<tr><td rowspan="3">6.4) Implementation steps</td><td colspan="3">See description above for details.

In summary:</td></tr>
<tr><td>1. Preparation: 1 year</td><td>2. Implementation: 3-6 months transition</td><td>3. Operation: Immediate starting of the operations by the start specified in the contract</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?

Cooperation of start-up company and large retailer.

Public transport authority is willing to support the business.</td></tr>
</table>

Figure 26: Radar chart on importance of private sector targets for Cargocycles

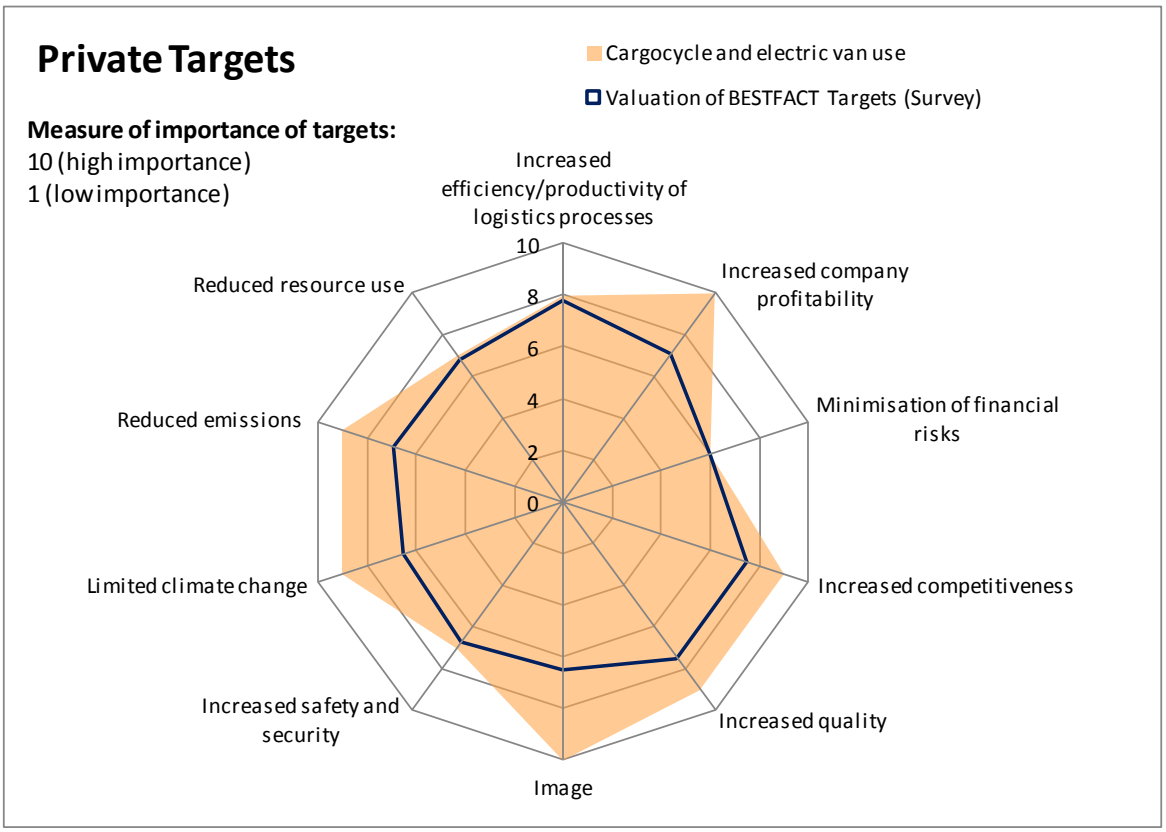
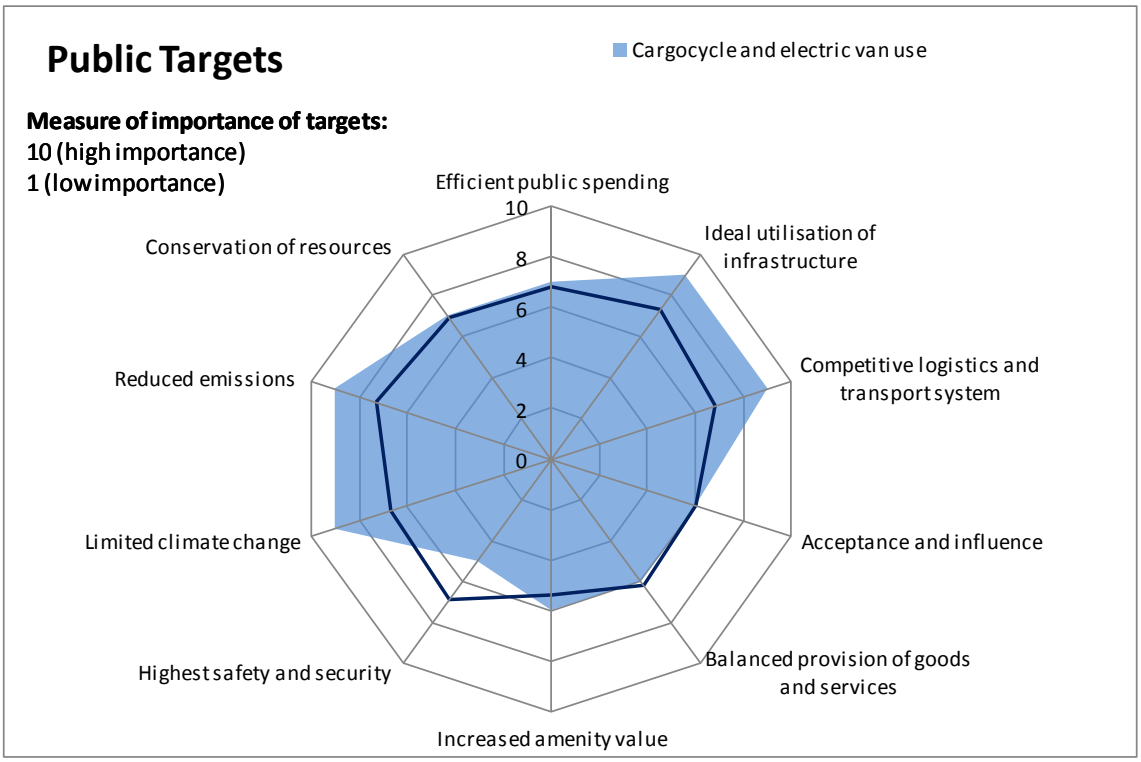


Figure 27: Radar chart on importance of public sector targets for Cargocycles use



2.2.3 Logistics tool for delivery management for trade fairs, Messe Basel

1. Basic information	
1.1) Identification	Logistics tool for delivery management for trade fairs, Messe Basel
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible authors/	Rapp Trans AG, Zurich The delivery management project was developed by Rapp Trans AG, Basel The project owner is MCH Group AG, Basel

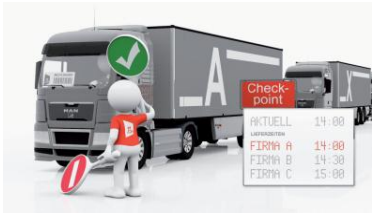
2. Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Trade fair operators and related service provider, exhibiting companies at trade fairs, logistics service providers delivering for trade fairs
2.3) Geographical Area	The tool was designed for the trade fair in Basel, Switzerland (Messe Basel)
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	The tool was implemented in the beginning of 2012. Further extensions will be added.
2.5) Date of implementation	The development of the tool started in January 2011, the online registration webpage went online in December 2011 while the first trade fair where the use was obligatory was held in March 2012
2.6) Link to other clusters	The tool used for the delivery management can be also regarded as a limited e-freight solution; providing an interface between trade fair operator and logistics service provider. An extension of the use of the technology to other domains and on a wider scale on other campuses and logistic intensive facilities (e.g. airports, harbours etc.) would be a good case to be considered in cluster 3.

2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ☒ Access to transport networks, infrastructure and nodes ☒ Freight consolidation and transhipment ☐ Implementation of low emission technologies ☒ IT-technologies and solutions (for management and administration) ☐ Innovative vehicles, vessels and equipment ☒ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ☒ Business to business (B2B) solutions, cooperation ☐ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ☐ Communication between authorities: cooperation, procedures, legal frameworks ☐ Communication between businesses and authorities: coordination, consultation ☐ Business models: new form of ownership, risk management ***Operations and Services*** ☐ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ☒ Innovative operational solutions ☒ Value added services, development (or extension) of services ☐ Service quality and sustainability agreements/certification ☒ Transport management, fleet management ***Regulations and Policy*** ☒ Access rules and restrictions of urban areas ☐ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ☐ Environmental standards and policy ☐ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ☐ Modelling and forecasting ☐ Data collection and statistics ☐ Education and training ☐ Working and implementation guidelines ☐ Monitoring and benchmarking of processes

<table>
<tr><td>2.8) Transport modes</td><td>Which transport modes/vehicle types are affected by the solution?
☒ Road/ truck ☒ Road/ delivery van
☐ Road/ motorcycles, scooter etc.
☐ Bike
☐ Heavy rail ☐ Light rail
☐ Inland waterway vessels ☐ Deep sea vessels
☐ Air freight/cargo planes ☐ Other: please explain …</td></tr>
<tr><td></td><td>Only road access to the trade fair facilities is possible</td></tr>
<tr><td>2.9) Supply chain elements</td><td>The logistics service provider of the trade fair is taking over the loads of deliveries at the entry point to the fair grounds. Thus following processes are involved:
- Transport (only a limited part of the tour)
- Loading/Unloading
- Handling
- Shunting, taxiing on the fair grounds
- Unpacking and packing of delivered materials</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>For public actors:
☐ Efficient public spending
☐ Ideal utilisation of infrastructure
☒ Competitive logistics and transport system
☐ Acceptance and influence
☐ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td><td>For private actors:
☒ Increased efficiency / productivity of logistics processes
☐ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☒ Increased quality
☐ Image
☒ Increased safety and security
☐ Others</td></tr>
<tr><td></td><td colspan="2">For both actor groups:
☐ Limited climate change
☐ Reduced emissions
☐ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td></td><td colspan="2">Increased quality of life in adjacent living quarters around the Trade Fair Basel</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☒ Affordable services (e.g. new affordable services or price reductions) ☐ Services in rural areas (new/additional service areas) ☒ Quality of services ☒ Reduced congestions ☐ Reduced emissions ☐ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ☒ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…

3. Best practice	
3.1) Description of the practice	Exhibitors, stand builders and other suppliers have to register online and in advance for all deliveries, pick-ups and transports to the fair grounds. All logistic processes on the grounds are exclusively handled by the domestic logistics operator. Confirmed and registered vehicles receive a delivery pass which contains a date and fixed time slot for delivery, information about the loading, company- and vehicle information. This information is also coded in a bar code for faster checking at the stations. For the registration about 480 time slots for deliveries per trailer truck are available per day, while some slots cannot be directly booked by users but have to be assigned by the trade fair management. At the designated time the vehicle has to check in at the fair ground check point which is located in the Basel port area, a 15min drive from the fair grounds with more space allocated to logistics activities. There all delivery information and cargo is verified and a parking space is assigned. Upon verification an access pass is handed to the driver including directions to the optimum delivery zone, where the loading is transhipped and therefore only handled by the fair ground logisticians. The time allotment for a vehicle in the delivery zone depends on vehicle type and loading. After transhipment the truck has to be removed from the fair grounds and take a new trip. Per stand daily deliveries are limited to 3 trailer trucks, with limited options for exceptions. The registration for deliveries or pick-ups is generally free of charge if performed regularly 2 days in advance. On shorter notice, up to 24h ahead, it incurs a charge; the scale depends on the specific event and ranges between €80 and €420. The steps in the process:

	Online registration of a delivery  Online confirmation with bar code  Access during time slot at check point  Access denied if time slot is missed 
3.2) Technical main characteristics	A developed online tool (accessible via https://ims.messe.ch) available in 5 languages (German, English, Spanish, French, Italian) needs to be used for booking of timeslots for deliveries. The needed login for the tool is send to exhibitors upon registration for a trade fair. An access pass has to be printed from a PDF format and be presented upon delivery to the checkpoint. At the checkpoint counter the printout with a barcode is scanned and all information is verified. If on time the driver can proceed to the designated position. If an early arrival occurs, the driver is handed a pager device that will inform the driver when a position is available for him.
3.3) Success factors	- Optimal operative processes dictated functions and development of the logistics tool (not the other way around) - Open and early communication strategy towards all involved actors and intuitive manuals and documentation - Thorough and stepwise testing before implementation - Close cooperation of involved actors (operators, city's urban planning department, IT department, project developers, marketing, customers)
3.4) Main benefits	A quantification of benefits does not exist yet and would be difficult to achieve. Traffic situation on access roads and in the vicinity of the fair grounds in delivery and pick-up phases has generally increased. Congestion levels were not measured. At the check point and the

	delivery zones no congestion occurred at all. The fair ground operator gains full control over the steering of all logistics activities. The provision of the logistics services was tendered to include all new and adapted processes. For the fair ground logisticians the situation improved vastly with introduction of time slots due to better planning of capacities. The efficiency of all logistic processes at the fair grounds improved according to feedback. Congestion on the grounds was reduced due to better scheduling of delivery and pick-up of materials and goods at the stands, leading to less time needed before and after a fair to build and deconstruct the entire setup. Through this efficiency gain new fairs can be added to the schedule in the future. The acceptance was very high, for the first fair event where the tool was in use almost 90% of the about 7'000 trips were pre-registered.
3.5) Cost indication	Main cost factors were the project development and the IT implementation. In other typical cost domains negative effects were prevented. Marketing efforts were sought by the individual fair events and the tool was adapted to the most efficient operational processes.
3.6) Barriers / Limitations	The main problem was the acceptance and support of the customers (stand builders, exhibiting companies, fair event agencies) since a major part of planning ahead was required by them that was before dealt with on a more short-notice and operational basis by the trade fair logisticians. An early and open communication strategy helped to overcome these problems and allowed to demonstrate benefits for all users of the tool.
3.7) Common practice before implementation	The usual common practice was that broad daily time windows were set wherein exhibitors could directly deliver their tools, equipment and materials for building their fair booths and their setup to the reserved location on the fair grounds. In 2010 the fair operator made the use of their own logistics operator on the grounds compulsory. Exhibitors were asked to deliver their goods to a transfer station where they were taken over by the fair logistics vehicles for the last section of transport to the designated locations.
3.8) Motivation/problem	The fair grounds in Basel are located in a central part of the city. The access roads are narrow and do not allow for shunting with trucks. The space for parking and idling is also very limited around the grounds since they are integrated in a residential and public area. The buildings and fair ground facilities are also undergoing major construction works even further limiting the space available at least until Q1 2013. The limitation of space led the fair ground operator to develop a new management for the logistics on their grounds. Limiting conflicts between trucks manoeuvring, loading/unloading or waiting and parking in the vicinity.

	The increasing demand for transports to the fair grounds also with higher requests for just-in-time deliveries peaking on the day right before and just after fairs being held led to further increasing traffic problems.
3.9) Justification of practice	The case delivers a relatively simple solution for the specific problem of the Basel fair grounds while also being a transferable solution that can be adapted by many similar urban facilities or logistic intensive campuses. The shift of planning ahead from the fair operator to the exhibitors and their logistics service provider was achieved right from the start. The increased complexity for the delivery planning was accepted while benefits resulted for all involved actors. While the complexity for the campus management is explicitly reduced a comparable solution on this scale is not known

4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	No special requirements towards the implementation of the tool and the management system are needed
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The management system could be used for all delimited areas, with limited space and with high traffic intensity, or where the use of a single logistics service provider is compulsory. Other domains could include: harbours, airports or larger public events
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☐ Yes ☒ No
	Since the referenced case is employed on private grounds it is not bound to specific political framework conditions or regulations.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☒ Yes ☐ No

	The solution could be most likely used on all trade fairs in Europe or other comparable campuses (see above). Further integration of additional functionalities is planned. Especially the automated invoicing for billable registered transports or all fines that incur due to misuse or missed time slots will further extend the practicability of the tool.
4.5) Similar cases	A similar case where the use of a central logistics service provider on the fair ground in combination with an online pre-registration for the delivery management in place is not known.

5. Additional information	
5.1) Considera-tion for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The high level of acceptance, transferability and benefits provided makes this case a good candidate for in-depth review. The difficult analysis of quantifiable results only slightly reduces the attractiveness of the case presentation. Monitoring is in place and aided through re-curring, comparable events that allow exemplifying the development of the tool and all related processes.
5.2) References	MCH Logistics Tool Brochure: http://media.messe.ch/epaper/mch/2011/en/Logistik_Prozess/index.html Rapp Trans AG project information: http://www.rapp.ch/en/trans/our-services/application-areas/logistics/Referenzen/4_Logistiktool-Messe-Basel.php Logistics process description for BASELWORLD 2012: http://www.mch-group.com/~/media/mch-group/Documents/PdfTemplates/Standorte/Basel/Logistik/NM%20Logistik_Prozess_Aussteller_Standbauer_BW12_V5a_en.ashx Benz, Simon (2012): Logistiktool MCH Messe Basel, Company presentation (not public, available upon request: simon.bohne@rapp.ch)
5.3) Contact for further details	Simon Benz, Rapp Trans AG Basel, +41 61 335 79 10, simon.benz@rapp.ch Joachim Ruf, Fair Grounds Basel, Joachim.Ruf@messe.ch
5.4) Date of re-view	Last update 12/12/12
5.5) Pictures	A video and brochure of the practical use of the tool can be found on the operators webpage: http://www.mch-group.com/en-US/Exhibitor/MesseBasel/Services/Logistics.aspx See Figures 5 to 9 Section 2.1.11

6. In-depth information (FILL ONLY FOR IN-DEPTH ANALYSIS)	
6.1) Costs	Other cost factors that were identified include: - Development of the IT tool and complementing equipment - Development of processes (incl. analysis and new ideas) - Restructuring of processes - Education, qualification and training of personnel - Minor infrastructural adjustments at the check point, new signage - New equipment: scanners, printers at the check point - Information campaign The implementation phase is responsible for the majority of costs (estimated about 2 years, until all fairs have been held at least once with the new processes). The increased effectiveness afterwards is to offset all temporary costs within short operation for all fairs.
6.2) Benefits / Strengths	A monitoring process is defined. Indicators will be analysed in detail after every fair event has been held at least once or twice so that comparability of numbers can be assured (exp. available end of 2013/early 2014). - Reduction of traffic congestion on major national and transnational routes (inner city roads and Autobahn). For peak delivery and pick-up days related to major fairs 15km of congestion were measured due to trucks blocking the highway exits in order to reach the checkpoint. This congestion is now effectively avoided for each event. - The use of automated IT supported processes at the check point allows the handling of 95% of all arriving transports within less than 3 minutes. The aim is to reduce this requirement below one minute from handing in the documents until receiving a designated loading position. - Automation of billing and invoicing related to all logistics activities - Efficiency gains are reflected in time gains within the occupancy schedule on the fair grounds. Through consolidation eventually additional events can be held at the fair grounds: increased capacity utilisation and increased revenues.
6.3) Weaknesses	The checkpoint remains the bottleneck of the fair grounds logistics. The use of fixed time slots leads to a distribution of traffic and congestion but does not resolve the increasing demand for individual deliveries. Limited steering is possible through the adjustment of cycle times, the time between two possible timeslots. For the deliveries the stand builders and suppliers are losing flexibility for their deliveries because they have to plan ahead (this is not necessarily a weakness but a change that requires adaption at first). Since use of the tool is The 3 min handling time of each arriving transport is to be reduced to

<table>
<tr><td></td><td colspan="3">one minute. The current longer duration is based on the calibration between IT equipment and IT software which prevents a faster data processing but is foreseen to be resolved within 2013.

Another challenge is the management of exceptions, especially when it comes to fee collection. Some deliveries that have not been pre-registered, are urgent, occur multiple times daily or are necessarily outside of possible time windows are subject to additional fees. To not penalise legal exceptions a manual check and control is necessary until a IT internal solution is found.</td></tr>
<tr><td rowspan="3">6.4) Implementation steps</td><td colspan="3">What are the different actions necessary in the implementation steps and how long does each step take (estimates)?</td></tr>
<tr><td>1. Preparation: In the preparation phase (~3 months) for the logistics tool a thorough analysis was performed for all processes at the trade fair, involving transports and logistics. Also an analysis was performed for the processes of the logistics service provider of the trade fairs</td><td>2. Implementation: An IT system was developed to suit the needs of the fair ground operator. The development took about 11 month and was adapted and integrated into the projected processes.</td><td>3. Operation: Communication to all involved actors is most important. Also the integration and highlighting of the logistics tool and its benefits within the sales for fair stands is vital for the increased efficiency of all trade fair processes. The vital operation/use phase is estimated to take 2-3 years, until every fair has been held 1-2 times. Afterwards the tool will be in the mature stage.</td></tr>
<tr><td colspan="3">The management of the trade fair is the key actor. They need to provide all relevant data and map all their relevant processes for the analysis and data collection through the project developer (which is preferably an external or in-house consultant). In the project team the developer, management and an IT developer should consider the results of the preparation phase to optimise future logistics processes and coordinate the development of the logistics tool. It is important to consult the logistics service provider of the fair grounds to define interfaces with their operative processes to be included in the final tool and corresponding equipment.</td></tr>
<tr><td>6.5) Process</td><td colspan="3">Key to the implementation, use and acceptance of the new tool was the communication with all relevant actors. The first use of the tool was for the largest fair in Basel (Baselworld) and required the trade fair to identify all relevant actors to be addressed with information concerning the use of the new tool. A 7 page guidance document with descriptions of processes, time planning, necessary procedures and fees was distributed to identified exhibitors, stand builders, external logistic service providers and suppliers. Included were the access details to use the online tool. A challenge was to reach all actors since different fairs</td></tr>
</table>

	have different managing units with separated contact databases. Optimisation and consolidation of the actor database is envisaged. Also a user friendly documentation and unification of guidelines for the use of the logistics tool, procedures and a new fee catalogue are set as goals for the further smoothening of communication processes.
6.6) Technical feasibility	The case is technical feasible. The basic functionalities of the tool are already providing clear benefits and are easily implemented. In addition the case helps to increase efficiency in all logistics related processes and will eventually support monitoring

Figure 28: Radar chart on importance of private sector targets for Trade Fair Basel

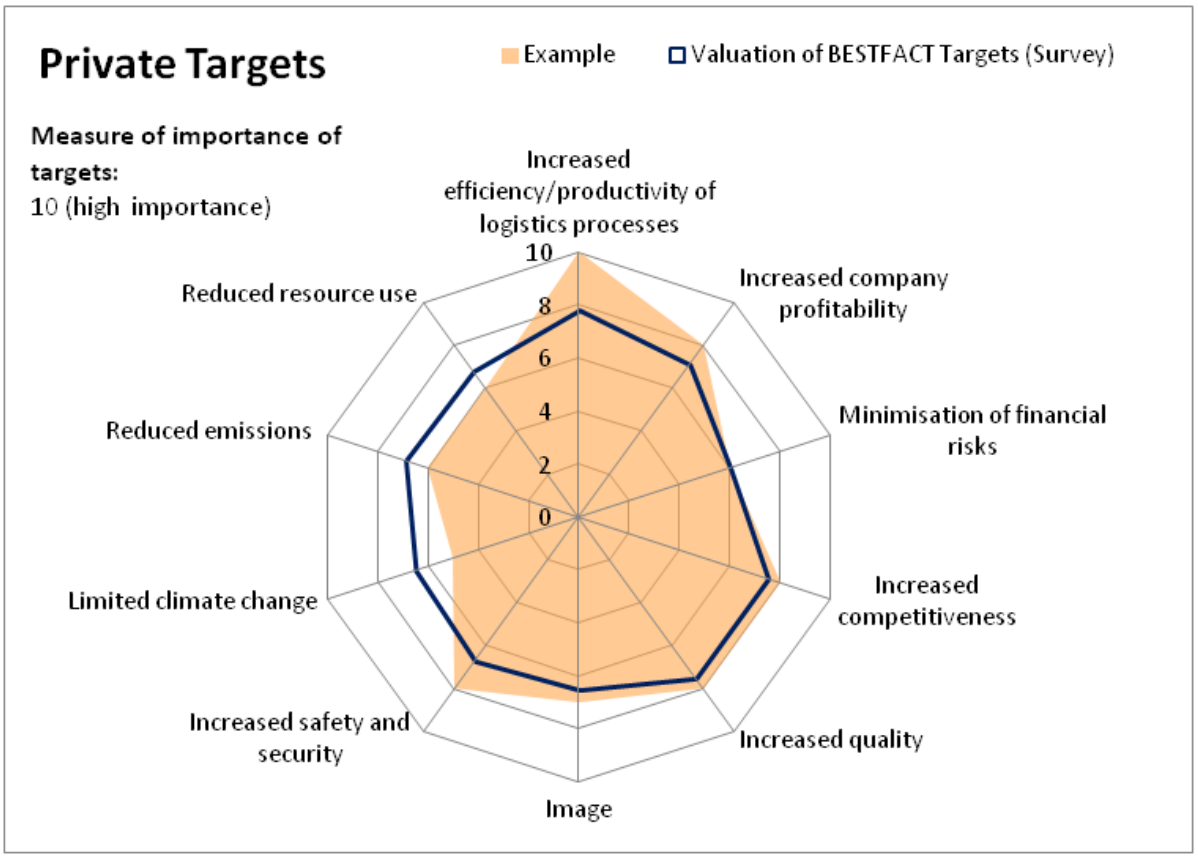
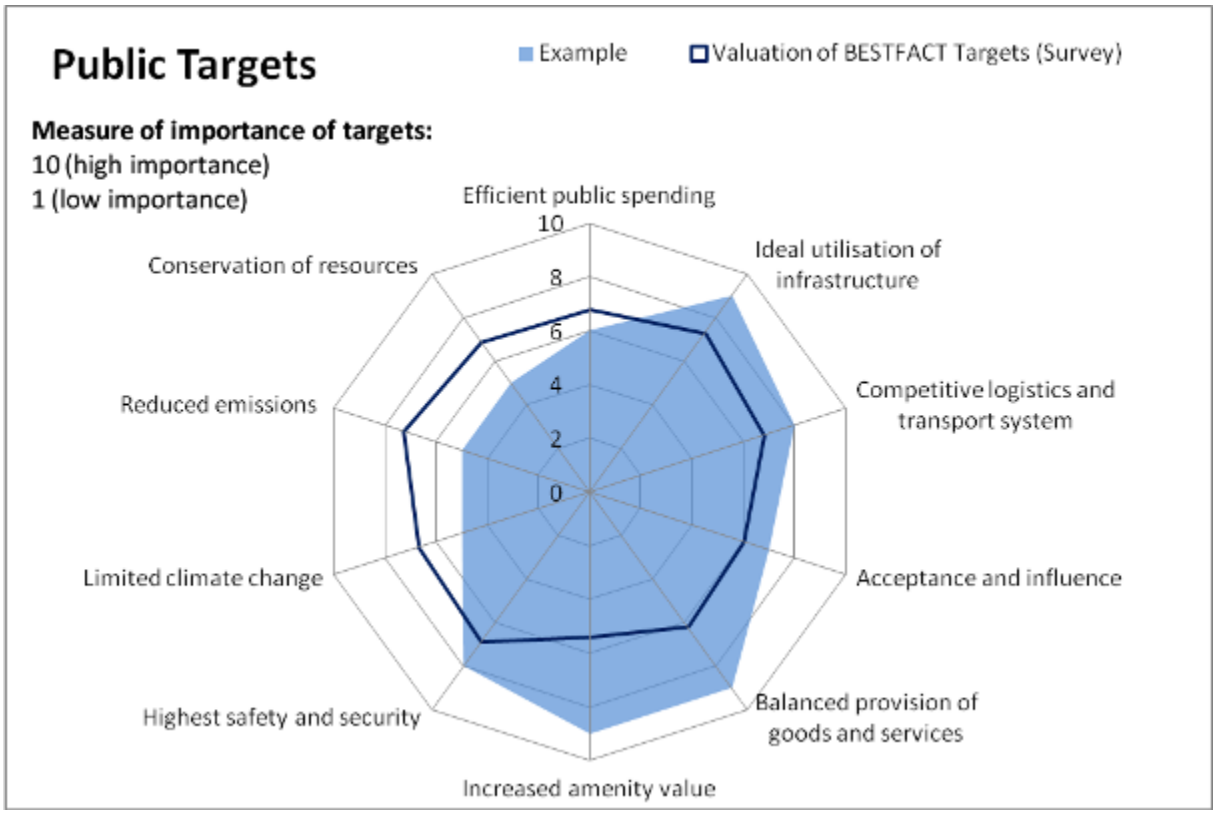


Figure 29: Radar chart on importance of public sector targets for Trade Fair Basel



3 Synthesis within the cluster

3.1 Topics covered

Topics covered in Cluster 1	Number of inventories
Infrastructure and Technology	
Access to transport networks, infrastructure and nodes	3
Freight consolidation and transhipment	9
Implementation of low emission technologies	6
IT-technologies and solutions (for management and administration)	4
Innovative vehicles, vessels and equipment	5
ICT (e.g. routing, guidance), transport optimisation	6
Organisation and Cooperation	
Business to business (B2B) solutions, cooperation	4
Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes)	4
Communication between authorities: cooperation, procedures, legal frameworks	2
Communication between businesses and authorities: coordination, consultation	4
Business models: new form of ownership, risk management	2
Operations and Services	
Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery)	5
Innovative operational solutions	8
Value added services, development (or extension) of services	2
Service quality and sustainability agreements/certification	2
Transport management, fleet management	8
Regulations and Policy	
Access rules and restrictions of urban areas	6
Land use and spatial planning: assessment and siting of transport facilities and infrastructure	3
Infrastructure financing: taxation, user charges, PPP	2
Environmental standards and policy	2
Interoperability and standardisation: vehicles, equipment, loading units, infrastructure	2
Safety and security: measures, regulations, insurance	2
Knowledge, Tools and Methods	
Modelling and forecasting	3
Data collection and statistics	4
Education and training	2
Working and implementation guidelines	2
Monitoring and benchmarking of processes	2

Table 4: Topics covered and cited in the 15 Cluster 1 inventories

Freight consolidation, transport management and innovative operational solutions are the most cited topics. Low emissions vehicles, ICT (routing) transport optimisation, and access restrictions are less often cited. No topic presented in the list received less than 2 citations.

3.2 Strategic targets covered

Targets supported by Cluster 1 cases	*Number of inventories*
Public sector	
Efficient public spending	0
Ideal utilisation of infrastructure	7
Competitive logistics and transport system	7
Acceptance and influence	3
Balanced provision of goods and services	4
Increased amenity value	1
Highest safety and security	3
Others: Attractive inner-city	1
Private sector	
Increased efficiency / productivity of logistics processes	11
Increased company profitability	7
Minimisation of financial risks	0
Increased competitiveness	6
Increased quality	8
Image	8
Increased safety and security	5
For both actor groups	
Limited climate change	3
Reduced emissions	12
Conservation of resources	5
Others? Reduced congestion	3

Table 5: BESTFACT targets supported by and cited in 15 Cluster 1 case inventories

Increased efficiency and reduced emissions are the two targets that are most often cited in the case inventories. Surprisingly, efficient public spending and financial risk minimisation were not cited at all as being targets supported by the case implementations activities.

3.3 Regional coverage

Geographical Coverage	CL1
International	0
Europe	0
EU	0
Multi country	0
Northern Europe	0
Western Europe	6
Eastern Europe	2
Southern Europe	3
Central Europe	4

Table 6: Regional coverage of the case inventories and in-depth surveys

4 Concluding report

4.1 Coverage of cluster topics

There is a good coverage of BESTFACT topics within Cluster 1 case inventoried in this report. See Table and comments in Chapter 3.1 above.

4.2 Conclusions

The collection of the inventory cases has been an important step in the work of BESTFACT Cluster 1 during 2012. The cases provide the basis for the in-depth surveys. It can be noted that it has been easier to collect the cases then to carry out the further in-depth surveys.

The bottom-up approach of putting forward examples and then selecting 15 of these for further development was built on a national approach. The national approach for the development of the inventory cases and the further analysis that was carried out in order to prepare the documents has ensured that the solutions are considered relevant at a national scale even when they have been applied only in one city or urban area.

The problems of **innovations** in urban freight have been confirmed. Many solutions are trialled and some are developing a slightly higher market share, for example consolidation and clean vehicle projects.

On **transferability**, very few large scale transfers are occurring. If any, the transfer is mostly limited to another company, to an upscale within a company or to a transfer to another city

On **impacts** and **benefits**: Very high benefits were obtained for most of the projects presented but there is a clear and recurrent difficulty with the quantification of robust impact estimates. The most difficult is to evaluate the private sector benefits in terms of profitability of the solution applied, partly because time is necessary to establish a new business practice.

On **data availability**, the biggest difficulty is with data on the 'Before' situation, in order to obtain the business case information out of the trials and tests.

Rarely, it is possible to have a full scale and long term assessment of the innovation transfer or of the upscale process of innovation:

Prototype → Trial → Industry Scale

Despite the complexities outlined above and the inevitable lack of some detailed data in many cases it has been possible to obtain relevant business cost data and this clearly supports decision making at the company level.

Annex

Table: Name and short description of the 93 submitted cases.

No.	Short Name	Short description
1	Delivery Management for Trade Fairs	Concept and tool to realise the management of deliveries for trade fairs
2	Optimisation of Waste Collection in the City of Zurich	Introduction of underground waste containers and optimisation of waste collection tours
3	Underground road freight access for shopping mall	For a new shopping mall "Sihlcity" an underground high quality and efficient road freight access has been implemented.
4	Home delivery Service from Shopping Mall with E-Bikes	For a new shopping mall "Sihlcity" a home delivery Service was implemented
5	Establishment of Logsitics Cluster Basel	Within the Basel area a logistics cluster has been established to improve the framework conditions for logistics activities
6	Securing logistics areas in land use plans	Within the Basel area there is an initiative to secure areas for logistics activities in industrials zones
7	Guidelines for design for freight access and loading/unloading areas	For the city of Zurich guidelines for the design of the freight access for facilities and areas have been developed
8	Handbook for urban freight planning	Handbook which shows how to integrate freight transport in urban transport planning
9	Modal Split Conditions for freight intensive facilities	Definition of Modal Split conditions (share of rail transport) for facilites with a high freight intensity
10	Environmental friendly two and three weelers for postal services	Use of environmental friendly vehicles for urban distribution
11	Electric vans for urban distribution	Use of electric vans for urban distribution of drinks
12	Urban Freight Data Collection	Improvement of the data collection on urban freight
13	Optimisation of deliveries for bakeries	Concept and implementation of an optimised delivery for bakeries
14	Cityporto Padova	City logistics cooperative system in Padova - now to be extended to parcel and perishable goods delivery
15	Veloce Logistic Vicenza	City logistics cooperative system in Vicenza - creation of a "eco-logistic" center
16	ECOCITY Parma	Goods distribution in the City of Parma performed by eco-friendly vehicles and commitment of shopkeepers
17	TNT High Street Fashion	Fashion goods delivery in top shopping streets in Milan
18	BENTOBOX Italy and France	Innovative box for parcel delivery and pick-up (developed in CITYLOG Project)
19	MERCI in Centro-Como	Within SMARTFUSION Project, the existing city logistics service "Merci in Centro" will be revamped through tests of innovative e-vehicles equipped with metering devices
20	City Logistic Verona	Goods delivery in the centre of Verona through a urban consolidation center appointed by a public evidence procedure
21	City Logistic Venezia	Goods delivery in the landside of Venezia through a urban con-

		solidation center appointed by a public evidence procedure
22	Cityporto Aosta	City logistics cooperative system in Aosta - based on the City-porto Padova model
23	RECODRIVE - Rewarding and Recognition Schemes for Energy Conserving Driving, Vehicle procurement and maintenance	Achieving lower fuel consumption of waste collection vehicles in urban areas with implementation of driver training, motivation and rewarding measures.
24	CO2NeutralAlp	Introduction of integrated inter-modal bus-cableway and bus-ski-lift tickets on a newly specified urban public transport line.
25	Ljubjana Freight Network	Establishment of a local freight network with the most important stakeholders of the Ljubljana city logistics system. Started with the EU project S.T.A.R.T. and ongoing today.
26	Electric Delivery Vehicles	Introducing electric vehicles for postal services in the city center of Ljubljana, Koper and Celje.
27	Management of Pedestrian Zones	Implementation of pedestrian zones and unloading/loading areas in Slovenian cities
28	Waste collection optimisation	Optimisation of waste collection in an urban environment with the use of optimisation algorithms and Geographic Information Systems Through optimisation, waste management companies can improve their profitability and sustainability by minimizing the length of routes their trucks drive, thereby cutting their overall fuel consumption and decreasing their carbon footprint.
29	ILoS	Indicators and potentials of intelligent logistics in urban areas by using Floating Car Data (FCD). The objective of ILoS is the development and definition of indicators to describe the saving potentials of transport tours in urban areas under consideration of traffic information obtained through Floating Car Data, as well as the development of appropriate quantification methods to deduct these indicators from route analyses in order to exploit a possible saving potential.
30	Traffic Management for the historic centre of Salzburg	Car free zone
31	iLadezonen	Intelligent load-space-management and - routing: The project i-Ladezone focuses on two major topics. The first is the development of management methods in order to open deliver opportunities for an efficient and effective monitoring of the occupancy of loading zones by loading vehicles and private cars, the second topic focuses on the development of a management system for keeping the loading zones at a maximum availability and reduce impacts on traffic by the loading processes. Also included is the development of an intelligent routing application for mobile use for the drivers of the goods suppliers.
32	Laboratory area and freight strategy	Test area is foreseen for urban freight related pilots/new projects development
33	Electric/Hybrid vehicles tests including SMARTFUSION	Emissions peaks and air quality information will be collected along delivery corridors from an urban interurban transhipment centre to the inner city. The demonstration project will be performed using hybrid trucks instead of diesel vehicles.
34	TNT Bentobox testing	Bentobox is a flexible delivery solution for retailers located in

		downtown shopping centres that allows the delivery of parcels outside the regular working hours (for example during the night or early in the morning). Bentobox is a simple solution: trolleys – or mobile containers – are loaded with merchandise for shopping malls in the depot by TNT. Then the trolleys are delivered to an automated parcel station within the shopping mall, before or after opening hours. The driver inserts the trolleys into the dock station, triggering an automated alert that notifies the customer of delivery by SMS or email.
35	TNT mobile depot	TNT express: mobile depot:TNT will limit its impact on urban congestion while at the same time reduce CO2 and noise pollution and consolidate good flows eliminating the use of vans and replace them with bicycles and an electric vehicle. This is in order to lead the way in overcoming last mile urban distribution difficulties through creating a best practice in energy reduction by using a mobile consolidation centre.
36	UCC l'Hospitalet de Llobregat	DHL Urban consolidation centre in Straightsol (2013-2014). The key objective is to concentrate goods in the urban distribution in order to improve the efficiency of the last mile network. Most interurban delivery trucks will unload its goods in the terminal and the last mile distribution will be carried by the terminal operator. It is affecting all parts of distribution: urban, interurban and terminal. The initiative is strongly supported by the city council of L'Hospitalet de Llobregat.
37	Retail supply chain management and "last mile" distribution by use of standardised information	Automatic data capture, standardization and sharing of freight transport information to harmonize urban transport activities. The Straightsol demo in Oslo will show urban transportation authorities, LSPs and retailers how automatic data capturing and information sharing will make it possible to harmonize the urban transport to achieve environmental and economic benefits. Shopping centre management may be able to offer better logistical infrastructure and service to retailers and the in house goods flow may be better coordinated and more efficient. The demo will be performed at a shopping centre in the Oslo region, with deliveries from warehouses in outer city or suburb areas. Many small receipts during the same day from different LSPs is inefficient, and it is almost impossible to do the receipt control of goods at delivery time. Another challenge is the lack of logistical collaboration between retailers at the same shopping centre (mall).
38	TNT night deliveries in Utrecht	TNT Night deliveries, liability and safety issues in Straighsol. The demonstration will show the possibilities and impacts of night-time distribution for the retail sector. A key element in this consideration is a closer look at the advantages of the concept other than costs and speed. To what extent does the concept reduce emissions, reduce fuel consumption and reduce pollution in downtown locations? What are the hard facts and constraints to build the case to switch transportation from day to night?
39	FREILOT Helmond	Cooperative Systems and urban freight delivery applications. The FREILOT consortium, supported by the European Commission, aims at increasing energy efficiency of urban freight through deployment of ITS (Intelligent Transport Systems) services. This will be done by achieving three challenging objectives:

		1. Showing quantifiable benefits to all relevant stakeholders 2. Ensuring that FREILOT implementations continue after the pilot 3. Extending the implementations to more cities and/or truck fleets
40	GOFER	Cooperative Systems and urban freight delivery applications: The main objective for the GOFER project is to contribute to a reduction in emissions, queues, accidents and operator costs related to heavy freight, by introducing new technical solutions and ways of cooperation. The GOFER project idea is to develop concepts which facilitate control and management of heavy freight vehicles, much the same way as the air control manages airplanes approaching or leaving an airport.
41	ECOSTARS Rotterdam	Recognition Scheme. ECOSTARS Europe strategic objectives are: to increase the energy efficiency of freight distribution by giving recognition and publicity to transport operators using sustainable practices in their procurement and management processes
42	ECOSTARS Ostrava	Recognition Scheme. ECOSTARS Europe strategic objectives are: to increase the energy efficiency of freight distribution by giving recognition and publicity to transport operators using sustainable practices in their procurement and management processes
43	ECOSTARS Edinburgh	Recognition Scheme. ECOSTARS Europe strategic objectives are: to increase the energy efficiency of freight distribution by giving recognition and publicity to transport operators using sustainable practices in their procurement and management processes;
44	ENCLOSE project	Enclose objective is to deliver a framework for the definition of Sustainable Urban Logistics Plans for Small-Mid size historic towns. The ENCLOSE Project will look at logistics problems facing small and medium size historic towns (SMHTs). Targeted actions will be implemented to increase the energy efficiency of freight distribution in urban areas, bringing together local authorities and local stakeholders, such as fleet operators, distributors, retailers and customers, to develop schemes to coordinate, manage and inform urban freight operations better.
45	TRUCKSAFE	Safety charter and label for safer road transport
46	Delivery Service Plans in TRAILBLAZER	TRAILBLAZER aims to showcase existing good practices and promote public sector policy interventions which can bring about a reduction in energy used in urban freight transport. This will be achieved by municipalities, in partnership with their suppliers and the private sector through the implementation of Delivery and Servicing Plans (DSPs).
47	Emilia-Romagna region electromobility and urban freight policies	Updates in electromobility and urban freight policies
48	Bath consolidation centre (from CIVITAS)	Follow-up consolidation centre "A joint exercise with Bristol City Council to procure a contractor to operate the freight consolidation centre was successfully completed and the one year demonstration project for urban freight consolidation in Bath commenced on 4th January 2011. There are currently five

		businesses with eight stores that have signed up to the scheme."
49	TIDE project	Urban freight and electromobility ?
50	Freight plan and different actions included in this DSP, waterway	Brussels Region Urban freight plan is to be launched end 2012.
51	Clean Freight demonstration in Newcastle	Collaborative approaches for urban interurban shipment planning within Smarfusion (2013-2014) in Newcastle
52	La petite reine	Company specialized in the delivery in large towns with electric cargocycles (4 big French cities of which Paris).
53	Elcidis	Urban Distribution Centers in La Rochelle - Electric vehicles deliver parcels and packages in La Rochelle and collect packages for deliveries outside the city. Project started first deliveries in 2007, now with one 3.5t electric van and one small electric van. 14 regular commercial clients.
54	Deret	Urban distribution with Electric Vehicles in the city centers of the big French urban areas. 50 electric vehicles in 21 cities.
55	Certibruit	Noise reducction in delivering - Label
56	Franprix entre en Seine	Use of waterways for urban supply. Franprix is going to delivers its stores in Paris via the Seine river. Partnership with Norbert Dentressangle for final road delivery, Voies Navigables de France and Port de Paris for infrastructure use. Resulting in a reduction of 3800 trucks on the road per year.
57	Distripolis in Paris	Distripolis of Géodis appears as a sustainable urban distribution network (supply in large quantities, optimized network of city logistic centers and electric vehicles)
58	Hotel logistique Sogaris	Near Gare du Nord in Paris, planning and construction of a logistics hotel for different urban freight carriers and servicing businesses. Use of clean vehicle is integrated into the construction plan, and ecological aspects of the building are offering a much improved environmental impact of the warehouse and depot facility.
59	European Central Bank Darmstadt	Restructuring of the former central market area: construction site logistics
60	DPD total Zero	Electric vehicle use at DPD Stuttgart/Ludwigsburg - Field test of parcel delivery by use of Vito E-CELL
61	Electric engine exchange	Exchange of conventional steering engines by electric ones at UPS Stuttgart ?
62	eVito	Electric vehicle use at DHL Stuttgart/Ludwigsburg - Field test of combined delivery of parcels and mail by use of eVito
63	Berlin field tests	Commercial transport activities Berlin - Quite different activities and field tests are ongoing or planned
64	Lithuanian Post	Urban distribution with electric vehicles
65	UDC network of 4 Major Retailers	Urban distribution centres network of 4 major retailers in Lithunia (MAXILA, IKI, RILI, NORFA - retailers of food and home products prevailing more than 95 % in the national market)
66	KAUTRA parcel public boxes system	Parcel and small cargo delivery using interurban bus system
67	ASSORTI retailer	Delivery to door of households service network (ASSORTI re-

		tailer of goods customized for children, babies and their baby sitting-parents).
68	TXITRANS Cargo bikes	The delivering of goods using three-wheeled ecological vehicles
69	Sustainable urban freight distribution (Txita - San Sebastian)	Urban specialization, adapted vehicles to the reality, more routes for circulation, time limitations disappear, peripheral storage and traceability.
70	Multiuse lane for freight distribution	Taking a lane to function more "natural", meeting the needs of traffic and based on time slot. The main goal is to gain parking spaces for residents.
71	UCC l'Hospitalet de Llobregat	DHL Urban consolidation centre in Straightsol (2013-2014). The key objective is to concentrate goods in the urban distribution in order to improve the efficiency of the last mile network. Most interurban delivery trucks will unload its goods in the terminal and the last mile distribution will be carried by the terminal operator. It is affecting all parts of distribution: urban, interurban and terminal. The initiative is strongly supported by the city council of L'Hospitalet de Llobregat.
72	EMEL loading/unloading regulation in Lisbon	Loading / unloading operations management and regulations Lisbon (Portugal). The Straightsol demonstration will be based on an analysis of the problems that led to the failure of the previous technological solution devised by the municipality of Lisbon for the loading/unloading operations management. We will investigate possible alternatives to this system, either in terms of technological solutions or of policies / regulations, including the possibility for the implementation of a "Red Route"" system, consisting on road markings that represent areas where loading / unloading is forbidden or restricted to certain time periods.
73	Dynamic parking spots reservation (FREILOT Bilbao)	The book of a slot previously to the delivery vehicle arrival. The tool is complemented with a web where users can see the slots available and make the reservations
74	Gnewt Cargocycle freight in London	Use of a consolidation centre in central London and use of electric vehicles and electric tricycles for final retail distribution
75	Regent Street consolidation centre	Run by Clipper Logistics for deliveries to several retail shops in Central London
76	DSP as a solution for large retail businesses	Delivery and Servicing plan and waste management of a Shopping Centre in a medium siezd town in United Kingdom
77	DSP as a solution for small businesses	Deliery and Servicing Plan and fleet management of a small business in a small town in United Kingdom
78	Impact Assessment and Business Case of Freight Operator Recognition Scheme in London	Developing and improving the management tools in use by the local administration for an urban freight solution in a large metropolitan area
79	Cooperative ITS platform	First commercially available cooperative ITS platform ensuring communication between vehicles as well as between vehicles and roadside systems. It is aimed at road administrators, emergency services and logistics businesses. The platform consists of a vehicle router, a roadside unit (RSU) and a web-based control tool.
80	Niewmarkt consolidation	Urban distribution in Amsterdam Nieuwmarkt by consolidation of freight (expectation of a 10 % reduction of the number of trucks).

81	Binnenstad service Nederland	Goods are delivered at a distribution centre just outside the city. From there the goods are brought to the shops. Simultaneously empties/emballage/paper is taken back to the distribution centre.
82	Lean and Green Award for cities	This is a process to help cities become more "green" with respect ot urban distribution.
83	Cross Chain Control Centre (demo project)	On a daily base, individual shops receive many small shipments of many different suppliers, each organising their transport individually. "Bundling at source location" aims to do this differently. In this project, multiple suppliers of fashion retail products collaborate horizontally to bundle volumes in Asia and prepare shipments of multiple suppliers sorted for individual stores.
84	Freight Hitchhiking (R&D project)	This project will design integrated people and freight synchromodal transportation networks and the related coordination (4C), planning and scheduling policies to enable efficient and reliable delivery of both persons and small- to medium-sized freight volumes.
85	Urban distribution in Utrecht	Done with the "beer boat"(an electric, zero emission boat), cargohopper (electric delivery vehicle) and other thing
86	DHL parcycle project	DHL adds another 7 city centres to parcycle project - distribution of parcels with light weight cargo bikes
87	Mokum Mariteam	Similar to Beer Boat
88	FietsExpress	Package deliveries with bicycles
90	Centrumservice	Similar to FietsExpress
91	Green City Amsterdam	Green City Distribution in Amsterdam: urban distribution with electric, natural gas or biodiesel
92	020-stadsdistributie	Fresh, cool and frozen urban distribution of goods with clean vehicles
93	Slow logistics (longer lead times)	Slower delivery of goods, waiting longer than usual before making the deliveries to the clients (in jargon 'longer lead times'). A duration of up to +2 days is allowing the carrier to deliver later and enables better load factors for its fleet, lowering the fuel costs and other costs per load unit.