BESTFACT

Best Practice Factory for Freight Transport

Internal Report Cluster 1 2013

IRCL1.2

Urban Freight

Innovations and solutions for sustainable deliveries

FINAL

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List of selected 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
EC	European Commission
EMF	Elektro Multifunktion Vehicle
EnBW	Energie Baden-Württemberg
FedEx	Federal Express
GIP	Graph Integration Platform
GIS	Geographic Information System
GPS	Global Positioning System
HET	HET Hochleistungs-, Eisenbahn- und Transporttechnik Entwicklungs-GmbH
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 (Smart Goods Logistics in Urban Area)
IRCL1.1	1st internal annual report of Cluster 1
IT	Information Technology
ITS	Intelligent Transport Systems
Kg	Kilogramme
Km	Kilometre
Km/h	Kilometre per hour
LP	Lithuanian Post
m^2, m^3	Square metre, cubic metre
NO_x	Generic term for mono-nitrogen oxides NO and NO_2
NPV	Net Present Value
PM_{10}	Particulate Matters (particles of ~10 micrometres or less)
PPP	Public-private-partnership
PROMIT	Promoting Innovative Intermodal Freight Transport
PS	Polystyrene
RFID	Radio-frequency identification
ROI	Return on Investment
UCC	Urban Consolidation Centre
UDC	Urban Distribution Centre
UPS	United Parcel Service
WP2	Work Package 2 (of BESTFACT project, dealing with Methodology)
ZTL	Low Traffic Zone

1 Summary of the Urban Freight cases 2013

1.1 Binnenstadservice Nederland

Binnenstadservice Nederland is an innovative concept that has been applied for five years in 15 cities in the Netherlands. Binnenstadservice manages an Urban Consolidation Centre (logistics depot and distribution service) on behalf of retailers and other organizations located in the city centre. Goods destined for these retailers are delivered to this consolidation centre, by freight operators. At this centre, goods are bundled and delivered to shops in the city centre. Simultaneously empties/packaging/paper are returned to the consolidation centre.

1.2 CITYPORTO – Last mile deliveries in Padua

Cityporto is an Urban Consolidation Centre (UCC) service operational in Padua, Northern Italy, focusing on deliveries to the central area 'Low Traffic Zone' of 830,000 m^2. 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). Cityporto has been operating since 2004 and performs more than 100,000 deliveries per year (2012), for 65 customers (most of the couriers and forwarders operating in the city).

1.3 The Green Link: last mile with cargo cycles and vans in Paris

The Green Link (TGL) is a company making parcels deliveries in central Paris with an entire fleet of battery electric vehicles. The business is proving to be profitable. TGL started operations in 2009 and is now using 3 urban depots (green hubs) in Paris and trying to develop in other French cities and other countries. At the end of 2013, the volume of parcels distributed was 2,500 per day, and the business is expected to grow to a volume of about 5,000 parcels per day in 2014. The scale of growth is limited by the size of the current depots.

1.4 Gothenburg City Logistics Initiatives

The City of Gothenburg has developed and applied a bundle of city logistics policies and solutions, including the regulation of city centre and shopping area, developing new infrastructure, establishing a consolidation centre, promoting the use of clean vehicles, developing trials of innovative solutions, monitoring and data collection on new vehicles and new technologies. The solutions have been developed coherently and are supervised by a well-established network of experts active in different businesses and public sector institutions.

1.5 Urban freight distribution with electric vehicles in San Sebastián

In San Sebastián (referred to as Donostia in Basque) an urban freight system has been implemented that replaces the use of diesel vans making direct deliveries from a suburban depot. Instead the goods are delivered to a small consolidation centre, before being dispatched to the final customer with a fleet of electric cargocycles. This in intended to reduce the negative impacts imposed on the inhabitants and urban space. The company Txita and the Municipality cooperated with several partners to set-up and manage this solution.

1.6 Use of electric vehicles for parcel distribution at UPS Karlsruhe

UPS is testing and analysing the use of a fleet of electric vehicles in urban traffic systems to reduce CO_2 emissions, noise and particular emissions. The vehicles being used are conventional diesel vehicles that have been modified into electric vehicles. These electric vehicles are being used mainly in inner city areas and on trips shorter than 80km. The vehicles return to the depot with about 20% residual charge and are then recharged at a specific loading facility by the responsible person. All vehicles are charged through the night.

1.7 City Logistics in Copenhagen using an Urban Consolidation Centre

The concept of Citylogistik in Copenhagen involves using an urban consolidation centre (UCC) for the supply of goods to the historical city centre of Copenhagen. All goods are shipped to and consolidated at a distribution centre outside the city and then transported by the City logistics provider Citylogistik-kbh to the customer. Citylogistik-kbh is an ongoing scheme started in 2012 that uses an environmentally friendly electric vehicle to deliver the goods to the stores located in the city centre.

1.8 Electrically assisted tricycle for parcel deliveries in France

'La Petite Reine' delivers purchases from big stores to consumer homes, using clean delivery vehicles, adapted to dense urban centres. Delivery vehicles are electrically-assisted cargo tricycles and electric vans. The cargo tricycles can go where small vans and other light commercial vehicle cannot (i.e. city centres reserved for the pedestrians, the tourist spaces, etc.). These vehicles are zero emissions, silent, ergonomic and agile.

1.9 Marleenkookt meal deliveries in Amsterdam

MarleenKookt cooks meals for those who are short of time or have other reasons not to cook for themselves. People have to order their meals on a website. The meals are then delivered to the consumers by e-cargobikes. The operating area is limited to the centre of Amsterdam. Most customers are private individuals; only about 10% of deliveries are made to companies.

1.10 Urban freight delivery B2C solution with clean vehicles: Emakers

Emakers offers clean deliveries with a fleet of electric and cycle freight vehicles, and a B2C solution for delivery management and information exchange. It has been an evolving operation offered in Spain and the UK since 2012. The products and services developed by Emakers in 7 cities consist of an efficient B2C solution based on technology, unique operations and sustainable vehicles.

1.11 Clean vehicle and city logistics scheme in Brescia

"Eco-Logis" is a distribution service operational in the urban area of Brescia (Lombardy-Northern Italy), focusing on the historical city centre and its Low Traffic Zone (LTZ). The manager is Brescia Mobilità, an in-house company of the City of Brescia, in partnership with OMB Inter-national (Logistics Manager), Cooperativa Facchini Bresciani (Personnel Manager), and Consorzio Brescia Mercati S.p.A. (Depot owner). The service has been operational since 2012 and was motivated by an objective to reduce the traffic congestion and pollution in Brescia city centre. The deliveries are performed by 11 LNG-powered vans. The depot is a 1000 m^2 wide urban consolidation platform located within the freight village.

1.12 Citylog EMF (efficient, modular, flexibel) – Electro-Multifunction-Transportation vehicle

Citylog EMF is a new type of electric freight vehicle developed in Austria by a consortium led by HET. The electric motor propulsion is fuel-cell based, and the vehicle concept consists of a series of 'self-driven' vehicles and 'trailers' that can be coupled to a train, and un-coupled for loading and unloading operations. The trials in Klagenfurt follow the prototype phase in which the technical feasibility has been demonstrated.

1.13 EMEL New loading/unloading regulation in Lisbon

The Lisbon Transport Authority (known as EMEL) has developed a new solution that helps mitigate specific traffic problems. The solution consists in the development and implementation of two technology based schemes:

- *Adapted Parking Meters that issue special tickets for 30 minutes of unloading/loading operations*
- *Detection sensors that detect the presence of a vehicle in the loading bay and send a message to the control centre of the Transport Authority (EMEL).*

1.14 GOFER cooperative system for freight management and regulation

GOFER'S main objective was to contribute to a reduction in emissions, queues, accidents and operator costs related to heavy road freight, by introducing new technical solutions and ways of cooperation. Three separate demonstrations took place in the project: A live demonstration on the 500 km route Oslo to Trondheim; a heavy vehicle driving simulator to study heavy vehicles prioritising measures in urban areas; and a simulation model for access to the Alnabru terminal area in Oslo. This best practice case describes the two first demonstrations.

1.15 Fleet Operator Recognition Scheme (FORS) in London

The London Fleet Operator Recognition Scheme (FORS) is a publicly-funded, voluntary certification scheme aimed at ensuring that fleet operators work lawfully and to best practice by meeting specified standard. It encourages behavioural change and is targeted at commercial operators, local authorities and procurement specialists. FORS generates actions by fleet operators as it requires them to meet standards and requires they demonstrate their safety, environmental and business efficiency performance improvement. In return fleet operators are awarded FORS awards.

1.16 Lean and Green Municipalities (Connekt) in the Netherlands

Lean and Green is a project lead by Connekt. Lean and Green supports and rewards organizations for reducing CO_2 emissions and costs. The main subject is the distribution of goods in inner cities, which is an issue of increasing importance due to urban infill and traffic congestion. Lean and Green is attempting to improve the collaboration between municipalities and local companies to reach shared goals. In addition, Lean and Green is sharing its knowledge with municipalities to solve practical issues.

1.17 Urban distribution of small parcels using self-service terminals in Lithuanian towns and cities (LP EXPRESS 24)

LP EXPRESS, a branch of the state-owned enterprise AB "Lietuvos paštas", adopted an innovative urban distribution system of self-service terminals. This self-service system, referred to as "LP EXPRESS", is the latest addition to the company's service offer, providing terminals that are available 24/7, located in 41 cities and town in Lithuania. The functionality of these terminals has been expanded to include that: users may drops off their parcels, send their parcels abroad, and choose other delivery options (e.g. couriers). Additionally, the unique operating system was developed to support these services.

1.18 Post Receiving Box by Austrian Post AG

The "receiving box" allows the deposit of registered mail at the customer's residence. If a shipment can not be delivered the postman deposits it in the receiving box and notifies the recipient with an RFID-Card in the letter box. The recipient removes the notification card from the letter box and uses it to open the receiving box.

2 Introduction of Cluster 1 Urban Freight

The objective of Cluster 1 and of this report is to better understand why selected urban freight solutions represent innovations that are technically feasible, economically profitable in different contexts, sustainable, transferable, and with tangible beneficial impacts. 18 solutions are evaluated in the fields of Urban Consolidation Centre, clean and electric vehicles, postboxes, IT solutions, use of recognition scheme, and others. Five solutions are analysed more thoroughly, the Urban Consolidation Centre of Cityporto Padova and Binnenstadservice, the innovative vehicles and last mile distribution concepts of The Green Link and of Gothenburg City Logistics Initiatives, and the Donostia San Sebastian freight trial. This report ends with a transversal analysis of the solutions observed, and with methodological conclusions.

This report is based on work being carried out in the cluster 1 of the EC-funded project “Best Practice Factory for Freight Transport” (BESTFACT) which commenced in 2012 and runs for four years. The project is examining best practice in urban freight transport, green logistics, co-modality, and e-Freight.

The objective of this report is to answer the following question: what are the current Best Practices in Urban Freight and what can be better understood on the benefits of these innovations that contribute to meeting policy objectives of reducing environmental impacts and at the same time improving company profitability? A number of studies have been published on methodologies and technologies for improving freight transport efficiency and the resulting environmental impacts (BESTUFS 2007, Browne et al. 2012). The core innovation of the approach presented in this report is to extend such best practice assessment methodologies towards more business oriented factors that are necessary to consider when implementing strategies within the industry and when applying more environmental and carbon efficient solutions within cities (BESTFACT 2013).

2.1 Current situation in the field

Two of the core problems faced by existing sustainability strategies in urban freight transport are the relatively small market share of clean technologies and the slow diffusion of technical innovations. Like in other business sectors, the technology innovation cycle in freight transport and logistics starts with a new idea, then progresses to prototype development and trial, and eventually leads to a full-scale industry or citywide utilisation. But when it comes to clean solutions and electric vehicles, there is a tendency for innovations to remain stuck at the level of small-scale field tests, and this is not well understood. The vast majority of the urban freight sector continues to use diesel trucks and vans, and fleet modernisation is slow.

The key practical output of this report is to give decision makers a better-informed knowledge base of success stories and a better understanding on why the solution is more profitable and beneficial than others. In achieving this objective, BESTFACT has revised the existing methodological approach of best practice evaluation to include a wider range of systematic and new information (Browne et al 2012). Emphasis will be put on transferability criteria and on costs and benefits for public and private sector initiatives.

It is also necessary to test and verify the effects of using this methodology in different business cases, economic fields and geographical situations in order to fully appreciate the fitness for purpose of this method and its usefulness for decision makers in different contexts. One of the key objectives of this report is the observation of 18 promising measures evaluated by the end of 2013. In this report, 5 of these initial cases and results are presented with an intermediate level of detail – the so called in-depth reviews - illustrating the application of the methodological innovations, and preliminary conclusions and lessons learnt are drawn.

2.2 Cluster topics

The following overview presents all fifteen cases for the solutions that were selected and inventoried in 2012 in the urban freight cluster of BESTFACT. Table 1 shows the technical

feasibility and the public sector benefits of the applications. It is more difficult to show how some cases can contribute to lower the private costs of customers and improve the profitability of the logistics services using the new solution.

Since most cases are running for a period of time that is long enough to allow economic observations, and that a non-profitable case would have been dropped, it can be assumed that the private costs situation is beneficial for the running organisation.

Table 1: Overview of previous 15 Best Practice Cases for Urban Freight Transport in Europe in 2012

Name	Main characteristics	Costs	Data availability	Impacts & benefits	Barriers	Transferability	Success factors
Gnewtcargo	Electric vehicles and cycles	Not higher for clients. Profitable	Costs, traffic, benefits, emissions	Low traffic, noise and emissions	Private decision	High, confirmed	100% electric, forwarder decision
Distripolis	81 electric vans, >20 tricycles, UCC in 5 cities	+ 14% costs per parcel	Partly on traffic reduction	Low noise and pollution	Private investment decision	High, confirmed	100% electric fleet
Cityporto Padova	11 natural gas vans; UDC	Profitable since 2007	Well documented	Low pollution, traffic saving	Additional handling at UCC	Adopted by 5 cities in Italy	Access rules; good location
Basel Trade Fair IT tool	Planning delivery slots	Not available	Congestion, feasibility	Reduce congestion	Acceptance of customers	Given but not confirmed yet	Good communication
DPD Stuttgart	Standard battery electric van	Higher than diesel	On feasibility and emissions	Low noise and pollution	Private investment	Given and confirmed	Manufacturer decision
Binnenstadservice	UCC network	Lower costs for operators	Costs, traffic, benefits	Traffic savings	Willingness and behaviour change	High, confirmed	Cooperation and rules
Berlin laboratory area and Bentobox	Test area for cycle deliveries	No additional costs	Benefits, traffic, emissions	Efficient public spending	Private decision to start the trial	Given but not confirmed yet	Reduction of data collection costs and time
Multi-Use lane	In Bilbao	Not available	Partly on traffic and congestion	Traffic savings	Public decision	Given, transfer from Barcelona	One way streets >2 lanes
Franprix en Seine	In Paris	Not available	Traffic, benefits, emissions	Traffic savings	Limited area	To be confirmed	Supermarket chain decision
Maribor waste management	IT routing and scheduling	Lower costs	Routing and time savings	1/5 of traffic reduced	Public decision	To be confirmed	New algorithm
Cargohopper Utrecht	Electric vehicle	Not available	Partly on benefits & emissions	Low noise and pollution	Public investment	One case is running longer	100% electric, 3 m3 capacity
Zero Emission Boat	In Utrecht	Not higher than diesel	Costs, traffic, benefits, emissions	Low noise and pollution and distance	Limited area	One case is running longer	Beer for 60 customers
Cooperation of retailers	Lithuania supermarkets	Not available	Partly on traffic	Traffic and time saving	Private decisions	To be confirmed	Common use of network of depots
ILOS	Planning route with floating car data	Not available	Traffic and trip time reduction	Time and traffic saving	Integration to navigation systems	Given but not confirmed yet	Shorter route according to instant traffic
iLadezonen	Vienna loading bay management	Not available	Ongoing data collection	Time and traffic saving	Prototype only	To be confirmed	User friendly

Source: BESTFACT 2013

On transferability, which seems to be more challenging to assess than the cost-benefit situation, the information level and quality obtained is variable, but it tends to show that most of the solutions seem transferable.

However, only a few solutions have been effectively transferred to a larger scale, such as electric vehicles of Distripolis in France or the Binnenstadservice cooperation concept in The Netherlands.

2.3 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.

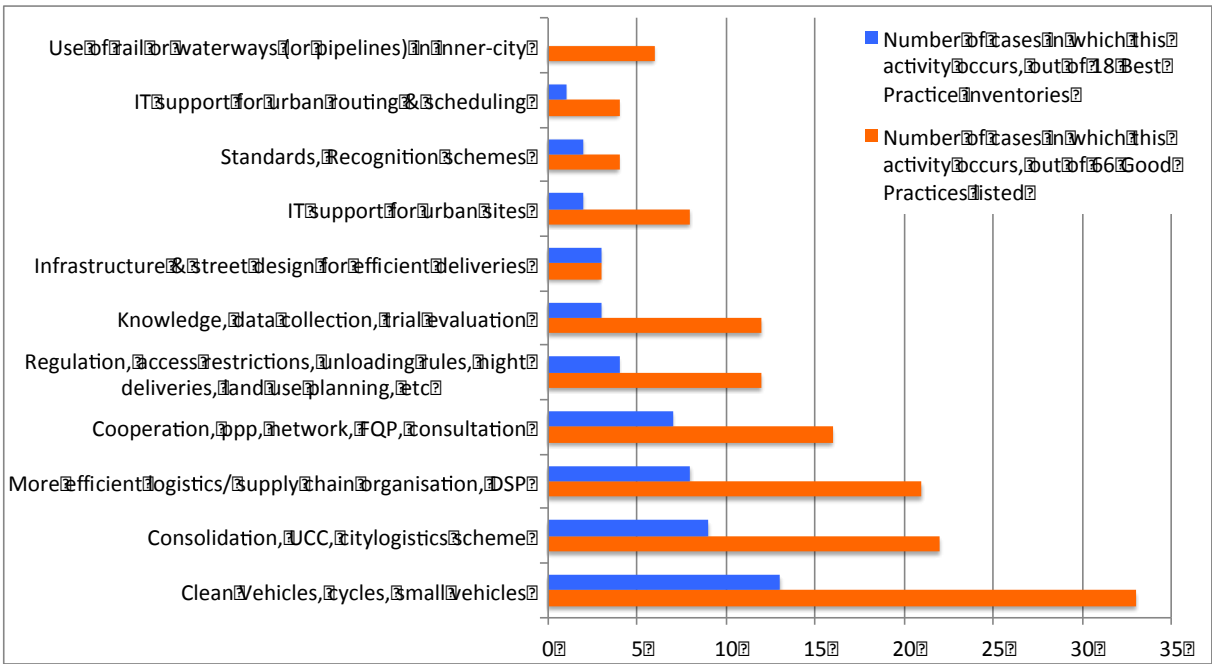
Among the numerous problems and gaps mentioned by experts and practitioners, the following list of urban freight challenges was developed from BESTFACT activities carried out in 2012 and 2013 including meetings and workshops, case studies and inventories collected and interviews with operators:

- High costs of electric vehicles
- Benefits are difficult to quantify
- Diesel fuel technology and infrastructure 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

2.4 Overview of inventory cases

There is a tendency towards more clean vehicle and consolidation centre use to be observed, as can be seen for the cases submitted by the partners for pre-assessment in 2013 (Figure 1). Other main topics of interventions are efficiency, cooperation, regulation and access restrictions, and data collection.

Figure 1: Overview of type of activities, expressed as total number of listed Good Practice initiatives within 18 inventories and 66 submitted cases in 2013



For 2013, 13 out of 18 cases were on clean vehicle use and 9 on consolidation (Figure 1). Binnenstadservice, Cityporto Padova, The Green Link, Gothenburg, and Donostia are 5 of the 18 inventories that mention these activities. These 5 cases are the selected in-depth reviews of 2013.

Recognition schemes, IT support for urban routing and scheduling, and use of alternative modes are the topics that are the least represented in the Urban Freight cases 2013. The list of inventory cases 2013 is presented below in Table 2 and the details of each case in chapter 2.

Table 2: Overview of CL1 Best Practice cases 2013: inventories and *in-depth reviews*

BESTFACT ID number	Short Name	Summary Description of Best Practice Case
CL1_072	EMEL unloading regulation in Lisbon	New loading/unloading regulation and parking meter/loading bay surveillance technology in Lisbon
CL1_097	LP Express24	Urban distribution with locker banks.
CL1_102	Citylog emf	Citylog emf (efficient, modular, flexibel) – electro-multifunction-transportation vehicle
CL1_103	Post empfangsbox (post receivers box)	Post receivers box is installed directly in houses and offers the possibility to drop boxes instead of having multi-trial-deliveries
CL1_104	La Petite Reine	Delivery with cargocycles in inner-cities in france
CL1_105	*Cityporto Padova*	*City logistics cooperative system in Padova - now to be extended to parcel and perishable goods delivery*
CL1_107	Lean and Green award for cities	This is a process to help cities become more "green" with respect ot urban distribution.
CL1_108	*Binnenstadservice Nederland*	*Goods are delivered at a distribution centre just outside the city. From there the goods are brought to the shops. Simultaneously empties/packaging/paper is taken back.*
CL1_111	City logistics in Copenhagen	Copenhagen city logistics development project finds ways to reduce delivery truck traffic in the city area.
CL1_125	Gofer	Cooperative systems and urban freight delivery applications.
CL1_139	Ups electric van use in Karlsruhe	Use of electric vehicles for parcel distribution at ups Karlsruhe. Exchange of conventional steering engines by electric ones at ups Karlsruhe
CL1_152	Eco-logis Brescia	City logistics cooperative system in Brescia - now to be extended to parcel and perishable goods delivery. A sussesfull transfer of BP from Cityporto Padova.
CL1_153	FORS	Freight operator recognition scheme in London
CL1_154	*The Green Link*	*Parcel service distribution with electric vehicles in Paris*
CL1_155	Marleenkookt	Marleenkookt meal deliveries in Amsterdam
CL1_156	*Donostia*	*Urban freight distribution with clean vehicles in San Sebastian Donostia*
CL1_157	*Gothenburg*	*Gothenburg City Logistics Initiatives*
CL1_158	Emakers	Emakers urban freight delivery solution with clean vehicles

3 Case list

3.1 Inventory formats

3.1.1 Binnenstadservice (NL)

1) Basic information	
1.1) Identification CL1_108	Binnenstadservice Nederland
1.2) Cluster	Urban freight
1.3) Responsible authors	- Mobycon - Eco2city (info@eco2city.nl)
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	- freight transporters (carriers) - shippers - retailers - shopkeepers - local authorities
2.3) Geographical Area	Nijmegen, Netherlands
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	Binnenstadservice Nederland (BSN) started in Nijmegen. At this time, after 5 years, about 14 other cities are working with the Binnenstadservice concept.
2.5) Date of implementation	April 16, 2008
2.6) Link to other clusters	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
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	- Cross docking, delivering goods - Storage - Handling - Unloading / loading - Warehousing - Transhipment - Unpacking

	- E-Fulfilment	
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, 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, increased service level
	For both actor groups: ☐ Limited climate change ☒ Reduced emissions ☐ Conservation of resources ☒ Others? Please specify: reduced congestion	
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) Social benefits	Where does society 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	

3) Best practice	
3.1) Description of the practice	Binnenstadservice Nederland is an innovative concept already applied now for five 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-/packaging/paper is taken back to the distribution centre. Binnenstadservice does not operate their own vehicles, but this is subcontracted to one of two logistics service provider per city. One of them can be the local bike courier. Through the efficient logistic solution the city centre gets cleaner and more liveable. 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 centre it improves the environment for habitants and customers.
3.2) Technical main characteristics	- availability of a warehouse (urban distribution centre) - availability of clean distribution vehicles (by local partners) - ICT system for handling orders, labelling, etc.
3.3) Success factors	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	The main benefits of Binnenstadservice are: Financial benefits: - Shopkeeper: reduced stock at expensive shop floor, reduced time needed to receive/ship goods, predictable process - 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. - reduced maintenance costs. Environmental benefits: - Reduced CO_2 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). See also 6.2.
3.5) Cost indication	The business model is based on the fact that both shopkeepers (end receivers) and shippers/carriers have a contract with Binnenstadservice. End receivers pay for the additional services (packaging, 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	Binnenstadservice needs a lot of retailers to join to create the critical mass to make it successful. In many cities Binnenstadservice started 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	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	Environmental concern (air quality and noise) 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	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. Solutions continued to be operational after a small period of public funding.
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

	The Binnenstadservice approach is now being transferred to the E-logistic market, to other actors and end receivers in the cities and to other areas beside the inner city.
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
	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 Belgium, Citylogistik Denmark

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 its roll-out in 13 other cities. The concept is continuously improving, so even if it has already been described in other projects, 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: 25 Nov. 2013
5.5) Pictures	   **Figure 2: Clean Binnenstadservice delivery vehicles in operation**
5.6) Involvement of SME	The customers in the cities, i.e. the receivers of the goods, are all retailers (shops, restaurants, café's, etc.) and they are all SME's.
5.7) Impact on SME	A more co-ordinated approach of the deliveries and sending of their goods (fewer deliveries at suitable times) will make their life easier. Furthermore they will need less storage space in their shops. And their shopping street becomes more attractive, thus potentially leading to more turnover.

3.1.2 Cityporto Padova

1) Basic information	
1.1) Identification CL1_105	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 appr.
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 m^2) 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: Green logistics. Cluster 3: e-freight. 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>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 …

Cityporto service is provided by 12 CNG-powered vehicles.</td></tr>
<tr><td>2.9) Supply chain elements</td><td>The main supply chain elements covered are:
• Warehousing (cross-docking)
• Last-time transport and delivery</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
☒ REDUCED CONGESTION DUE TO THE CONSOLIDATION OF GOODS</td></tr>
<tr><td>2.11) End-user benefits</td><td>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>
</table>

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 830,000 m^2. 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 more than 100,000 deliveries per year (2012), for 60 customers, the major part of which are couriers and forwarders that are operating in the city, including express couriers, but also SMEs that usually deliver their products 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 consultation of 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 CNG-powered vans; two of them are equipped for the delivery of temperature-controlled goods. The UDC is a 1,549 m^2 wide cross-docking platform (including a 229 m^2 -wide refrigerated cell) 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. Details on economic, environmental and social benefits are provided below in the in-depth review, section 6.2)
3.5) Cost indication	Cityporto annual turnover for delivery service is nowadays around 500,000 Euros, and the service is profitable. 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.
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 Padua 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 perishable goods.
3.7) Common practice before implementation	The common practice for delivering goods in Padua city centre, was to use diesel vehicles, vans and trucks, for direct transport from the manufacturers and logistics depots to the final customers in the delivery area.
3.8) Motivation/problem	The introduction of Cityporto service was motivated for limiting the traffic congestion and pollution of Padua 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 an 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 - COO of Interporto Padova pandolfo@interportopd.it
5.4) Date of review	Updated with new data on 26/11/2013 Note: This case is also subject of an in-depth review
5.5) Pictures	**Figure 3: CNG van used for last mile deliveries by Cityporto Padova.** 

	Figure 4: Location of the Cityporto depot in the main logistics area of Padova 
5.6) Involvement of SME	Many clients receiving their goods through Cityporto are SMEs and some of the transport operators making deliveries to Cityporto are SMEs as well.
5.7) Impact on SME	The future growth prospects of such a solution are good. SMEs can benefit from such a solution either by becoming a business partner or client, or by replicating the same solution in a different city or country.

3.1.3 The Green Link: Last mile with cargo cycles in Paris

1) Basic information	
1.1) Identification	The Green Link: last mile with cargo cycles in Paris
1.2) Cluster	CL1 (city logistics)
1.3) Responsible authors	Christophe Rizet, IFSTTAR, Christophe.Rizet@Ifsttar.fr
2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transportation business, logistics service (the last mile) provider,
2.3) Geographical Area	France (Paris)
2.4) Implementation status	☐ Evolving Best Practice ☒ Best Practice
	Business of parcels deliveries in central Paris with a fleet of 100% battery electric vehicles is profitable on the market. The Green Link is now operating 3 urban delivery centres (green hubs) in Paris and trying to develop in other towns and other countries
2.5) Date of implementation	Business started in 2009
2.6) Link to other clusters	E-freight (CL3) for the IT management 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
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 …
	Electric cargo cycles and electric vans
2.9) Supply chain elements	Depot and transhipment operation management, fleet management, delivery management and transport operations
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: …
	Employment
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: …
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.** The Green Link (TGL) is a transport service provider that uses a 100% battery electric vehicle fleet for its commercial parcels delivery operations. The business is profitable and do not rely on subventions from the public sector. The main distribution centre is located in Central Paris near Gare de l'Est and from there commercial parcels deliveries are made for large companies such as TNT and FedEx in the central boroughs of Paris. Two smaller depots are also run to accommodate different distribution area, and these two depots are located in other central boroughs of Paris. The contributors of flow (TGL's clients) are either shippers (Coca-Cola, Eurodep a pharmaceutical agent specialized in the retail outlet, Saveurs et vie (see § 5.6) or large express carriers (TNT, Fedex, ...). They connect in the information system to announce the arrivals of parcel to deliver (addresses of delivery, type of parcel). This interfacing (EDI) allows an exchange of documents of multiple formats. With this information and according to the available capacity, delivery tours are optimised. The information system is monitoring the whole process. End of 2013, the volume of parcels distributed is 2,500 per day, and the business is expected to grow to a volume of about 5,000 parcels per day in the year 2014. The growth conditions are limited due to the available size of the current depots. The organisation of the logistics processes is straightforward. The goods arrive in the early morning hours, starting from 07.00, up to 09.30, at the depot. The parcels are coming by truck and vans from the larger regional distribution centres of the clients and then unloaded into the depot via pallets, before being sorted and loaded onto the clean vehicles. The fleet of electric vehicles consists of 2 small electric vans and 28 electric cycles (see pictures below). The distribution rounds are performed by a staff of 60 part-time and full-time drivers. The rounds start in the morning around 09.00 and end in the early afternoon mostly before 15.00. Very few evening rounds are performed for parcels collection. During the delivery tour, information is sent back in real time and can be communicated to the contributors of flow. The back office platform (CRM) and the Business intelligence tools allow

	a good reporting of TGL activity. The organisation structure of The Green Link is based on 1 owner and 1 depot manager. The sustainability impacts of this solution are rather high. Due to the substitution of the diesel van fleet through a battery-electric fleet, the supply chain emissions are strongly reduced, as operations are becoming almost completely emission-free for the final distribution in the part of the city that need it the most: the centre. On the supply chain legs between the suburban depots of the customers and the inner-city depots of The Green Link, the operations are occurring in a more consolidated way, so even if there are diesel vans in use on those legs, the overall load factor and the overall efficiency of the supply chain have increased and thus the energy use and emissions per load unit have decreased. The economic impact and the business benefits are good, and the company has developed a business model based on the successful acquisition of private sector contracts, and the cooperation with large parcel service providers.
3.2) Technical main characteristics	On the physical transport side, TGL is operating 3 depots and a fleet of 30 electrically assisted cargo cycles and 2 electric vans. The 3 depots, called 'green hubs', are located in the centre of Paris. The main depot size is 350 m^2, the two other depots are about 200m^2 surface. Depots are supplied outside rush hours, either by TGL or by the clients, generally by trucks. One of these hubs is located on the Seine river side and can be supplied by waterway. 28 cycles are self-manufactured. The cargo cycles have • A volume capacity of 1.5-2.1 m^3, • An empty weight of about 100 kg, • A load weight capacity of 200 kg (max. 30 kg per parcel), • A gross vehicle weight of 400 kg • a maximum speed of 25 km/h and • An autonomy of 20 km with a lithium battery. There is a possibility to take a supplementary battery in case of a long tour. These cycles are designed and manufactured by TGL. 2 'Goupil' vans are full battery electric powered, with a capacity of 2.5 m^3, 500 kg (a maximum of 30 kg per parcel), a maximum speed of 40 km/h and an autonomy of 100 km with a lithium battery. On the information system side, the central unit is interchanging data with the contributors of flow, in several formats, and pre-organising the delivery tours. The organisational interface scans the parcels at their arrival, consolidates the tours, dispatches the parcels, and sorts them according to their delivery rank in the tour. A web interface enables the real time tracking of deliveries and sends the final delivery report. A mobile application scans the parcel when delivered and send the delivery status.
3.3) Success factors	The main success factors are • a good mix of flows (e.g. one flow of parcels arriving early for delivery in the morning, one in the beginning of the afternoon and a third one later in the afternoon) and an efficient management of the transport chain though the information system • Managerial qualities of the owner and depot manager and excel-

	lent contacts to local businesses and decision makers. • Availability of space in Central Paris.
3.4) Main benefits	The main benefits are the improved environmental situation, with virtually zero tailpipe emissions, no air pollutants and a very much reduced noise emission during transport operation. Thanks to its electric fleet, TGL claims for delivering daily over 1000 parcels and for having avoided the emission of more than 20 tons of CO_2 and the consumption of 130.000 litres of diesel since its creation in 2009.
3.5) Cost indication	The economic benefits for the operator are given. Profitability is reached after few years of operations. The rental costs of the depot can be considered very high, compared to suburban depot rental prices: about 55,000 Euro per year for the main depot, about 20,000 Euro per year for each other two depots.
3.6) Barriers / Limitations	High price of locations in central Paris and limited range and autonomy of battery electric cycles are two main constraints limiting the rapid growth of this business. Even if a contractor would offer a substantial amount of parcels to be delivered, the operative limitations of the depot and fleet size would not allow starting immediately, as the capacity is now close to be fully used.
3.7) Common practice before implementation	Before subcontracting the last mile to The Green Link, each contributors of flow was delivering either by himself or with another 'last mile subcontractor', with diesel vans or trucks. Diesel van fleet were operated, starting every morning from the client's depots, located in suburban area of Paris, at a far distance from city centre. This transport is generating emission along the way in the morning peak, due to congestion on the main axis. The vans were also emitting during the round trip within the city centre area of delivery. These emission problems are now resolved.
3.8) Motivation/ problem	Congestion and pollution in Paris centre which slowed down the deliveries and made uncertain the usual transport in diesel vans: Very limited clean and small vehicle operations were occurring in the commercial parcels delivery sector in Paris before.
3.9) Justification of practice	The business model is successful and replicable, and the growth prospect of such a viable technology and profitable solution are excellent both for the current business owner and also for potential other start-up companies in other European capital cities. The Green Link is a Best Practice for commercial parcels deliveries under standard business conditions in Paris.
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)? No

4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Not only parcels but also other types of goods such as food, ready-meals or clothes are potentially relevant for this business. If one of TGL clients would try to operate the last mile by himself, he would not have that mix of flows.
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
	Electric vans are very expensive and the depots in central locations are also rare and expensive. Both topics justify that a public intervention would be adequate, for example in form of helping to find a central depot or access allowances to shopping centres or pedestrian zone for electric vehicles during the day, or other land-use related allocation of free parking and storage space reserved for clean vehicles in city centres.
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 green link could be extended to other towns but not in rural areas. It is clearly designed for dense cities. The successful transfer of such type of business did not occur until now in Europe. The Green Link is planning an extension of its operations into other cities. It is not fitted for rural or low density area.
4.5) Similar cases	There are several cases that look similar for the organisation (a depot with cargo cycles for the last mile) : Gnewtcargo in London is a company with a similar business model and both Gnewtcargo and The Green Link demonstrate similar beneficial impacts on the economic, traffic and environmental aspects of their operations. The two companies are not in competition, however, because the local markets are very different.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The available information are very crucial to the further growth of the business and also for the further extension and replication of this business in other conditions and countries.
5.2) References	The Green Link (2013): http://www.the-green-link.com/

5.3) Contact for further details	Michael Darchambeau The Green Link michael.darchambeau@the-green-link.com
5.4) Date of review	27 November 2013
5.5) Pictures	**Figure 5: Electric cycle operation in central Paris, 2013**  **Figure 6: Depot loading and sorting operation at The Green Link, Paris, 2013** 
5.6) Involvement of SME	The Green Link is an SME for last mile logistics. This 'last mile' service can help other SMEs like 'Saveurs et vie' (Flavours and life, which proposes personalized dietary meals): Together with 'The Green Links' they won a call

	for tenders from the municipality of Paris for delivering old person meals at home.
5.7) Impact on SME	The main impact of the SME, besides further developing the company itself into a larger business, rely in its potential of developing this kind of Best Practice activity and replicate the business model of the start-up phase on other markets, other French cities and in other countries. TGL might be suited for home deliveries together with other services at home as it is in the case of 'Saveurs et vie'.

3.1.4 Gothenburg City Logistics Initiatives

1) Basic information	
1.1) Identification CL1_157	Gothenburg City Logistics Initiatives
1.2) Cluster	Urban Freight
1.3) Responsible authors	Maria Lindholm, Lindholmen Science Park/CLOSER, Gothenburg Jacques Leonardi, University of Westminster, London

2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	Local authority, Industry, Commerce, Transport operators, Property owners, Trade associations
2.3) Geographical Area	Sweden (Gothenburg)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	The Gothenburg City Logistics initiatives were already successfully implemented and are ongoing (in various stages).
2.5) Date of implementation	What year (or more specific date if possible) was the new solution implemented? 2005 – The local freight network (urban FQP) 2008 – The micro terminal at Lindholmen (consolidation centre. Fully commercial since 2011) 2009 – "Walking speed areas" on streets in city centre (making deliveries easier). 2009 – Length restriction for vehicles in the city centre (10 m) 2012 – The consolidation centre "Stadsleveransen" in the city centre. Going into up scaling phase 2013/2014. 2013 – "The fish express": using a vehicle similar to the one used by stadsleveransen in order to transport fresh fish from the fish auction to the city fish market (cooperation between five businesses selling fish at the market). Under development.
2.6) Link to other clusters	• Green Logistics (CL3) • 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
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	A consolidation centre/terminal is used for Stadsleveransen as well as for the micro terminal. Goods are unloaded from a bigger truck in to the terminal, registered and then loaded on to a small electric vehicle or

	electric bike (Stadsleveransen). There is a possibility to use the terminal as a temporary warehouse for some goods by retailers.	
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) 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	The City of Gothenburg developed and applies a bundle of city logistics policies and solutions, starting from the regulation of city centre and shopping area, using consolidation centres and clean vehicles, developing trials of innovative solutions, monitoring and data collection on new vehicles and new technologies. The solutions have been developed and are supervised by a well-established network of expert.	
3.2) Technical main characteristics	Stadsleveransen: The project started in 2012 with a small-scale pilot action during half a year. A small number of shops were contacted (8-10) and asked to redirect their goods through the consolidation centre (using a c/o address). The consolidation centre was set up as a small terminal in the city centre, located in an existing parking garage and a small electric vehicle was used to deliver the goods to the retailers using the terminal. Responsible	

	for the terminal is the trade association of the retailers in the city centre. The terminal was operated by a security company (security guards). The pilot was during this phase mainly financed by projects, the local authority and the trade association together with a property owner in the city centre. During 2013 the pilot was scaled up and more streets in the city centre were involved in the pilot. In this phase the focus shifted from the retailers to the haulers and two of the haulers with biggest market share in the area did now redirect their goods to the area through Stadsleveransen. This increased the number of receivers of goods to 160 as well as the amount of goods. Up to November 2013 the number of receivers are 200 and discussions are also held with a third hauler to be involved in the demonstration. To help with distribution of the increased amount of goods, a transport company using electric cargo bikes have been added to the terminal. During this phase, additional funding of the demonstration came through selling marketing areas on the vehicle – a solution that serve as an important part in the business model of Stadsleveransen. During next phase the area will be increased, the terminal will be moved to a better location with larger space, and the solution will cost money for the haulers or transport operators that chose to use Stadsleveransen instead of performing the deliveries by themselves. Micro terminal Lindholmen: The micro terminal started during the START project in 2008 as a small consolidation solution for a campus area, but have since 2011 been fully commercial with 14 companies (increasing) connected to the terminal. The terminal are handling goods receiving/distribution and waste management (clean waste) and also mail. The terminal is operated by the service manager of the properties. Local freight network: The local freight network in Gothenburg was established as a part of the EU project START in 2005. Since then it has been developed and now has regular meeting 3-4 times per year gathering 20-25 participants from transport operators, trade associations, local authority, academia, property owners and retailers. The local freight network is a type of partnership, where the purpose so far has been to share knowledge and experiences between the participants as well as addressing specific problems arising within the central parts of the city aiming at finding solutions. Specific outcomes of the partnership have been • the introduction of a length restriction in the city centre, • walking speed area streets, • a parking and unloading practice guide. However, the most important outcome is the long-term interaction between the stakeholders that are involved in urban freight transport, the improved dialogue and the possibility to discuss and find solutions to everyday problems that are occurring in an easy way through direct contacts between stakeholders.

3.3) Success factors	Communication and Cooperation between partners were key for the success in establishing new citylogistics measures such as the consolidation centre and the electric vehicle project. The consultation activities were extensive and a high number or hours have been spent by the municipality service and the project management discussing the potential solutions and different approaches with receivers of goods/retailers, hauliers and transport operators. For this it was possible to rely upon a good network of local experts. The technical solution is feasible.
3.4) Main benefits	The main benefits are the environmental benefits associated with the use of clean vehicles, especially lower pollutants emissions, low noise and reduced CO_2 emissions. The other benefits are in the existing established stakeholder participation that enable to react to changes and new developments more effectively.
3.5) Cost indication	The initiatives have been supported by the Swedish Government and the Municipality of Gothenburg during the set-up and starting phases.
3.6) Barriers / Limitations	Main difficulty is to obtain an agreement of businesses and retailers to use the UCC and the clean vehicles, as it is requested that some of their long-term, established business customers relationships need to change. Second main difficulty is to cover the additional costs associated with the use of electric vehicles instead of diesel.
3.7) Common practice before implementation	Deliveries were made previously by diesel trucks and vans, originating from different suburban depots.
3.8) Motivation/problem	Need to develop clean solutions was key.
3.9) Justification of practice	The Gothenburg citylogistics initiatives can be considered a Best Practice because of the organisation of the UCC and clean vehicle use in combination with many other citylogistics actions such as partnerships, planning, vehicle testing, and access restrictions. The strongest point of this Best Practice is to have developed a multiple set of good solutions and to have integrated them into a coherent, global framework of citylogistics activities.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Network and partnerships are well established managerial solutions. The electric vehicle technology can be purchased and used in other cities.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No

	Citylogistics has a need for variable involvement of different stake-holders from industry, retail, transport and public sector, depending on which city and which project are being considered. The stakeholders are mentioned above in the description. The electric vehicles were first used for parcel distribution, then for recycling, and now for fresh food transport. It is expected that more branches of economic acitivities and different types of retail can benefit f
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 fully compatible with existing legislation and market practices.
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 extension to other cities is feasible, subject to organisational or political decisions.
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. Similar UCC developments combined with electric freight vehicles are in operation in many other cities in Europe. The particularity of Gothenburg is to have organised the UCC in combination with many other citylogistics actions such as partnerships, planning, vehicle testing, access restriction and others, as described above.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The long term dimension, the coherence, magnitude and strength of the approach, the diversity of the actions, the managerial innovation are very positive elements that would be worth investigating further. The transparency of the cost situation might become a difficulty when assessing the economic impacts and the business benefits.
5.2) References	SENDSMART (2013): http://www.lindholmen.se/sv/vad-vi-gor/closer/sendsmart-ett-projekt-hallbara-godstransporter-i-stadsmiljo Stadsleveransen (2013): http://innerstadengbg.se/innerstaden-goteborg/projekt/stadsleveransen/
5.3) Contact for further details	Maria Lindholm SENDSMART project manager Lindholmen Science Park AB Tel 031-764 70 19 maria.lindholm@lindholmen.se

5.4) Date of review	14 November 2013
5.5) Pictures	**Figure 7: Electric vehicle of Stadsleveransen used in Gothenburg**  **Figure 8: The micro terminal Lindholmen in Gothenburg**  *Source: Stadsleveransen (2013)*
5.6) Involvement of SME	SMEs are part of the project, e.g. the electric cargo bike company (Move By Bike) that have been added to the terminal Stadsleveransen.
5.7) Impact on SME	SMEs benefit from the project participation and from the future growth prospects of developing more clean transport operations in the city centre of Gothenburg.

3.1.5 Urban freight distribution with clean vehicles in San Sebastian Donostia

1) Basic information	
1.1) Identification CL1_156	Urban freight distribution with clean vehicle in San Sebastian Donostia
1.2) Cluster	Cluster 1. Urban freight
1.3) Responsible authors	Dolores Herrero - ITENE Patricia Bellver - ITENE
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	- San Sebastian City Council - IVL-LEE – Instituto Vasco de Logística (Basque Institute of Logistics) - Gea 21 - EHU - Universidad del País Vasco (Basque University) - Txita - DBUS
2.3) Geographical Area	Spain, San Sebastián
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	Fully inplemented and operating
2.5) Date of implementation	June 2010
2.6) Link to other clusters	This kind of distribution is connected with cluster 2, related to green 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
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 …

	Mainly bikes, due to their use to deliveries but also delivery vans, being them reduced by the initiative.	
2.9) Supply chain elements	The solution involves mainly the elements of Transport and Warehousing.	
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) 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	This measure consists in the implementation of a goods distribution model with less negative impacts on the inhabitants and urban space. A research study was conducted in Donostia - San Sebastián and the design of this was related to urban goods distribution. Elements ana-	

	lysed were: - Incidents that occurred during loading and delivery - Infrastructures and other means for shops and transport companies - Emissions and noise related to urban goods transit, consumption of energy and traffic density - Traffic control system Following the recommendations, an implementation plan was developed including the following measures: - Creation of a freight consolidation centre for the last mile distribution of goods - Use of clean vehicles for last mile distribution - Regulatory options to improve loading behaviour - Increased control in the use of loading bays - Design of a night distribution protocol - Use of new technologies to make easier the communication between the distributors and the local shops Finally, two measures were completely implemented: - Creation of a freight distribution centre - Use of bikes for deliveries
3.2) Technical main characteristics	- Municipal warehouse is perfectly equipped for reception and dispatch of goods with ecological vehicles. Located in the San Sebastian City Centre with approximately 500 m^2 of space. - Goods delivery system using electric cargo bikes. These vehicles are sustainable and adapted to the urban reality that offer innovative operational in urban freight distribution, extending service hours and eliminating CO_2 emissions.
3.3) Success factors	Different factors have contributed to transform the pilot toward a large scale business initiative that is successful on the market: - The preparation of the measure in co-operation with local stakeholders - The elaboration of a diagnostic study that also includes opinions and ideas of the stakeholders - The pilot experience - Combine new services and new regulations with improved enforcement - Combine implementation with mayor communication campaign.
3.4) Main benefits	Main benefits of this project are: - Reduction of trucks within the city. - Reduction of GHG, noise and air pollution. - Reduction of traffic congestion. - Extension of hours of loading and unloading without causing any problems to the neighbours, mainly in the Old Town. - Improvement of ecological position of the City of San Sebastián. The new delivery regulation for goods contributed to a reduction in

	the average journey length of delivery vehicles by approximately 0,5 km. The new last mile delivery service with electric cargo-bikes saved up to approximately 27,000 km per year. As a consequence, a yearly reduction of 22% in energy consumption was achieved, in addition to a significant reduction of carbon and pollutant emission levels. The transport companies reduced their operational costs by over € 7,200 per year. Regarding society indicators, surveys conducted reveal that nearly half of the involved population (neighbours, shopkeepers and transport operators) were aware of the initiatives put in place.
3.5) Cost indication	Here are some approximate costs of bike deliveries: - E-bike purchase price: 7250€ + VAT + transport - Maintenance: 30 €/month-bike - Insurance: 125 €/year-bike
3.6) Barriers / Limitations	<u>Limitations related to stakeholders:</u> The main problem in San Sebastian was unhappiness of some businesses about the new arrangements because of the changes that were required in relation to transport services. On the other hand, some supermarkets don't agree with pilot test conditions and they don't respect the regulations set out on it. <u>Limitations related to bikes:</u> - City Orography: on very steep slopes it could exist problems with bikes - Load capacity up to 100-150 kg - Bike battery autonomy (about 8 h charging) - Need of a centrally located distribution centre for transhipment of goods, suitable for key logistics activities of sorting and loading to bike rounds. This additional small distribution centre needs to be located within short distance of the final area of distribution. - Maximum one way distance of a customer serviced by bikes: • Medium load (70 kg):Up to 3 km from distribution center. • Packages: Up to 6 km from distribution center. • Light merchandise: Up to 8 km from distribution center.
3.7) Common practice before implementation	- There were streets in the area exceeding the decibel limit established as quality goal. Noises that were largely related to traffic levels and in relation to the urban distribution raised the need to control the technical characteristics of the vehicles, among others. - The distribution of goods was very problematic, existing two conflictive areas: Old Town and City Centre, with narrow streets, high number of stores and lots of restrictions in deliveries. - There was no homogenization of the loading and unloading times within different sections of the same street, which generated a great deal of confusion among users.
3.8) Motivation/problem	San Sebastian has a strong commercial and social activity, surrounded on its periphery with numerous industrial sites that generate a significant flow of goods, vehicles and people to the city centre.

	Before the project, the city centre had a high volume of traffic, noise and pollution due to freight transport.
3.9) Justification of practice	It can be considered as a best practice because it includes all aspects that define it: - Innovative and feasible: It supposed a revolution in San Sebastian City and it is still operating since 2010 and expanding. - Business and policy objectives: It was developed by the city council and operated by the private company "Txita". - Positive effects on business and policy targets: It is in concordance with governmental strategies and represents high benefits to companies. - Transferability: It was transferred to other Spanish cities (i.e. Barcelona with "Vanapedal")
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	It is necessary to consider the main limitations of this type of technology that are orography, density of customers and strong winter climate. Adverse conditions are very steep slopes, low density of customers that would require long distance delivery rounds and very cold weather or snow conditions that would not be suitable for electric bike.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	It can be transferred to mail or packages delivery
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
	Directive 2002/24/CE for electrical bikes certification
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 could be possible only with the creation of new distribution centres, because of coverage limitations.
4.5) Similar cases	Txita has extended their services to other cities like Bilbao. The Txita company has already "exported" the service to various other Spanish cities (i.e. Barcelona: VanaPedal, http://www.vanapedal.es)
5) Additional information	

5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	In Autumn 2013 Donostia San Sebastian freight practice is an initiative that is fully implemented, well working and expanding. Moreover, contact persons are willing to collaborate.
5.2) References	www.donostia.org www.txita.com www.citet.es www.civitas-initiative.org
5.3) Contact for further details	Andrés Martínez, Técnico de Movilidad - Ayuntamiento de Donostia andres_martinez@donostia.org
5.4) Date of review	14 November 2013
5.5) Pictures	 **Figure 9: Vehicle operations at Txita and Donostia San Sebastian**
5.6) Involvement of SME	- The company who delivers products with e-bikes, called Txita. - All SME's who use this system to distribute their goods.
5.7) Impact on SME	- For SMEs as users such as small retailers: The practice makes it possible for shippers or receivers to operate the distribution of their goods without limitation in time or zones.

3.1.6 Use of electric vehicles for parcel distribution at UPS Karlsruhe

1) Basic information	
1.1) Identification CL1_139	Use of electric vehicles for parcel distribution at UPS Karlsruhe
1.2) Cluster	Cluster 1
1.3) Responsible authors	Philipp Lenz, PTV

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. • Automobile Industry • Parcel logistics service providers
2.3) Geographical Area	From which country (and city) does the practice originate? Germany (Karlsruhe branch)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	In different projects, UPS evaluates the implementation of e-mobility in an existing van fleet and logistics processes.
2.5) Date of implementation	The project was started within the research programme “show case region for e-mobility” in Baden-Wuerttemberg for the period 2013 to 2015. The vehicles were put into operation in July 2013 at the Karlsruhe branch of UPS. UPS however is planning to use 7 of them for a longer period.
2.6) Link to other clusters	• The use of clean vehicles is linked to Green logistics (CL2) • The use of adapted Information Technology that is specific for electric vehicles is linked to e-Freight (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
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 …
	Six vehicles are already in use, one will be delivered still in 2013. In total, 19 all electric delivery vehicles in the 3,5t class are run by UPS in Germany.
2.9) Supply chain elements	Transport operations, fleet management, IT support of operations with electric vehicles, and planning and management of electric charging infrastructure.

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	*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? Increase the efficiency of routing	
2.11) End-user benefits	☐ 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:	
3) Best practice		
3.1) Description of the practice	Within the showcase project (ELMO – Elektromobile urbane Wirtschaftsverkehre), UPS tests and analyses the usage of a fleet of electric vehicles in urban traffic systems to reduce CO_2, noise and particular emissions. All electric vehicles are being used on trips shorter than 80km. They enter the branch with about 20% residual charge and are then being charged at a specific loading facility by the responsible person. All vehicles are charged through the night. The modification of conventional Diesel vehicles into electric vehicles reduces the costs because all other parts can be reused. The electric vehicles are mainly used in inner cities. Sensible regulations and incentives by city and municipality administrations are considered in the project too. Loading and unloading points especially for electric vehicles, reasonable time windows for inner city delivery and the usage of bus lanes are incentives that should be researched in UPS opinion. This is not the case at the moment but is discussed in close cooperation with the cities the electric vehicles are run in.	

3.2) Technical main characteristics	UPS approach is to use as large vehicles as possible to reduce traffic and emissions. In the parcels delivery business this means that the volume of vehicles is more important than the gross vehicle weight. Because there were no all-electrically powered delivery vehicles in the 7.5-ton class series offered on the market, UPS decided to modify their used, conventionally powered P80 vehicles which were then equipped with single battery cells that were controlled by a battery management system. The result is the new UPS P80-E truck. The vehicle was used in the city of Bayreuth, Bavaria, between 1995 and 2010 and did about half a million kilometres. The conversion was done in Southern Germany by the company “Elektrofahrzeuge Schwaben GmbH” (EFA-S). The standard cabin and cargo area design with a volume capacity of 23m^3 were not modified. Also the exterior design and painting of the standard UPS truck were kept identical, making the solution compatible with the fleet policy. Due to the weight of the electric powertrain and battery equipment, the available load weight capacity is now reduced from 3,990 to 3,450 kg. The vehicles were modified in close cooperation to make sure further developments can be implemented easily, e.g. vehicles’ efficiency was increased by a “direct drive”. This seems to be an interesting approach. They are equipped with a 1.200 Nm engine, almost 4 times the power of a conventional diesel engine. The engine is mounted in front of the rear axle and is powering it directly. Because there is no transmission necessary, weight and noise emissions are decreased. The Karlsruhe branch has two vehicles with “direct drive” and two with normal transmission. A software update changes the settings for the start-stop-system. Now, the power steering isn’t switched on and of permanently during shunting. A crash sensor switches off the high voltage system in case of an accident to protect all persons involved. An optimised position for the high voltage socket makes connecting the vehicle to a switch easier in case of close parking. Besides technical modifications of the fleet and the availability of electric charging points, all logistics processes remain identical.
3.3) Success factors	• All vehicles were previously used as diesel vehicles during a normal cycle of operation and now are reused in a second life cycle. • UPS uses the all-electric delivery vehicles in more and more regulated inner cities to ensure delivery to urban areas in the future. • User acceptance is constantly being scientifically monitored and shows very positive results. Both drivers and customers are interested and enthusiastic about electro mobility.
3.4) Main benefits	Environmental benefits Emissions are reduced for delivery and pick-ups. Tailpipe emissions are reduced to 100%, benefiting to air quality in city centre. Noise emissions are also strongly reduced, enabling potentially the change in scheduling towards more out of hours deliveries. The remaining CO_2 emissions in the transport system are coming from the electricity generation in Baden-Wuertemberg. The CO_2 content of electricity is depending from the proportion of fossil fuel used by the power plants.

	• Other signs/indicators of success? UPS experience the customers to be very interested and enthusiastic about e-mobility (Image)
3.5) Cost indication	Costs for the modification of conventional vehicles into electric ones are about the costs for another vehicle. So one modified vehicle costs about the same as two conventional ones. The German programme for electric mobility is a research programme subsidised by the government with 180 million Euros. The subsidy helps finance the fleet modifications. This subsidy at the start of an innovative project is corresponding to the normal situation for a new practice in sustainable urban freight. As long as the economic profitability is not demonstrated, the case is considered as evolving Best Practice.
3.6) Barriers / Limitations	• Costs (see 3.5) • Lack of planning reliability (legislation) • High maintenance required • Lack of flexibility due to restriction of range
3.7) Common practice before implementation	Use of Diesel or gas powered vehicles.
3.8) Motivation/problem	• Access regulations to inner cities and agglomerations are already strict and will become even stricter in the future • Customer wish
3.9) Justification of practice	This case demonstrates the feasibility of the full-electric technology for inner city parcels deliveries even for a very large global player with strict rules on fleet design and vehicle specifications. The trial is going beyond standard practice because of the large size of the operations of UPS, that will enable a rapid implementation and upscale in case of positive outcomes.
4) Transferability	
4.1) Geographical Area	**Can the solution be transferred to other countries, regions or cities?** ☒ Yes ☐ No
	The modified vehicles can be used everywhere where trips with complying range exist. It is however important to consider restrictions if the charging infrastructure can be adapted to the existing buildings. Another problem is difficulties in gaining admission to other countries for the modified vehicles.
4.2) Usability in other domains	**Can the solution be transferred to other actors or industries?** ☒ Yes ☐ No

	Generally every logistics service provider can use electric vehicles and EFA-S is a medium-sized company, not only working for UPS. Furthermore all essential results of research are being forwarded to consortium partners, scientifically processed and jointly analysed and evaluated.
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
	As mentioned in 3.5, electric vehicles aren't financially viable at the moment for logistics companies. To boost electric vehicles in urban distribution, incentives in terms of traffic are necessary. e.g. well located parking spaces, longer access times in pedestrian zones, sharing of taxi-ranks and usage of bus lanes.
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
	In close cooperation with local stakeholders and municipalities, the solution can be extended to other cities. The manufacture of electric powertrains and the adaptation of existing fleets is replicable for most diesel van types. UPS is following a purchase policy of buying a very large amount of identical 7.5t trucks with diesel propulsion engines for all Europe operation. Therefore, the way towards the use of electric vans can only be the replacement of diesel engines. As long as van and truck manufacturers are not offering a 100% electric truck that would be competitive in purchase price and running costs, compared to diesel vehicles, this situation might continue to be a severe constraint. At this stage, the purchase price of such a solution is expensive, since the diesel motor and all additional specific equipment that are not suitable for electric propulsion needs to be replaced. This is the reason why UPS was mounting this technology into used vehicles. The company Geodis in France had the identical problem with its need of fleet modification for Distripolis.
4.5) Similar cases	Many projects such as Distripolis in France, Gnewt in UK or Stadleveransen in Sweden are trying to develop 100% electric fleets for urban distribution. The main benefit of the UPS Karlsruhe trial is that it is run by a very large logistics organisation. The success in terms of use in standard operations and the adaptation of the new vehicles within existing fleet constraints makes its potential for upscale much more likely than for other projects. This condition makes its potential extension in Europe becoming more large scale than any other projects.

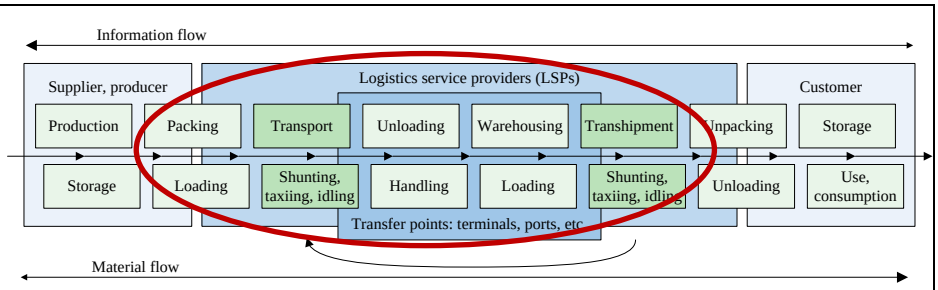
5) Additional information	
5.1) Consideration for in-depth analysis	**Should this case be further considered for in-depth review?** ☐ Yes ☒ No
5.2) References	ELMO project: http://eu.region-stuttgart.de/en/detail/303770 Press releases: http://efa-s.de/Eigene%20Dateien/Karlsruhe.pdf Specifications: http://efa-s.de/Eigene%20Dateien/UPS%20Datenblatt%20englisch.pdf
5.3) Contact for further details	Shirin Huber Public Affairs Germany UPS Deutschland Inc. & Co. OHG Görlitzer Straße 1 41456 Neuss Phone: +49 (0) 2131 – 947 25 52 Fax: +49 (0) 2131 – 154 89 42 shuber@ups.com
5.4) Date of review	November 12th, 2013
5.5) Pictures	

	 **Figure 10: UPS electric vans in delivery operations in Germany**
5.6) Involvement of SME	The German SME called EFA-S (Elektro-Fahrzeuge-Schwaben GmbH, Aich unter Zell) is a small manufacturer specialised in electric vehicles, in charge of adapting the standard UPS vehicles and mounting the electric power train. EFA-S is contracting another SME (Mosolf in Kippenheim) for further UPS vehicle motor exchanges from diesel to electric. The motor is a product of another German company called AMK Arnold Müller GmbH in Kirchheim unter Teck, that is not an SME, but it can be assumed that this company is contracting many German SMEs in the automotive sector for the supply of electric motors. UPS is not an SME and its business model does not foresee to subcontract its transportation and logistics tasks to SMEs.
5.7) Impact on SME	The modification is performed by two German SMEs. Like any other manufacturing projects, it is expected that many other parts of the new electric vehicle are provided by SMEs from the automotive sector.

3.1.7 Citylogistik-kbh – City Logistics in Copenhagen introducing an Urban Consolidation Center

1) Basic information	
1.1) Identification **CL1_111**	Citylogistik-kbh – City Logistics in Copenhagen introducing an Urban Consolidation Center
1.2) Cluster	CL 1 – Urban Freight
1.3) Responsible authors	Philipp Lenz, PTV
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	• Local authorities (municipally), • freight transporters, • retailers, • shopkeepers, • Third party logistics providers
2.3) Geographical Area	Copenhagen, Denmark
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	The Citylogstik-kbh started out as a conceptual development project. Now it has transformed into a demonstration project. The first phase – the conceptual development phase – was managed by the municipality of Copenhagen as lead partner in a consortium with CBS (Copenhagen Business School), the Danish Technical University and the Transport Innovation Network. This phase ended in 2012. In 2012, a new consortium with a private company (Citylogistik-kbh ApS), CBS (Copenhagen Business School), the Danish Technical University and Transport Innovation Network applied for a demonstration phase of 3 years. The Danish Transport Authority gave the funding and the demonstration phase started from the 1st of June 2013.
2.5) Date of implementation	1st of June 2013.
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
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 … See comments below

2.9) Supply chain elements	 It is planned to deliver as many logistics services as possible. City-logistik-kbh will be evolving and creating services together with the clients and other stakeholders.
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: …A better and more attractive city
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: Better service, value adding services which can reduce the total costs, put the end user back in charge of their own goods.
3) Best practice	
3.1) Description of the practice	The concept of Citylogistik in Copenhagen is to use an urban consolidation centre (UCC) for the supply of the city. All goods are shipped to and consolidated at a distribution centre outside the city. At the beginning of the initiative, an electric vehicle is used to deliver the goods to the different stores located in the inner city area. The starting point is the destination perspective rather than the origin

	perspective. In practise, this means the service is "sold" to the consignees (the receivers of the goods (shops etc.)). They then tell their retailer or transport provider that they will use the Citylogistik-kbh for the last mile delivery. This means that all transport providers can deliver their goods to the UCC. Until now, the transport operators have not been interested in using Citylogistik-kbh themselves for the last mile delivery. This is under development because the operator of Citylogistik-kbh would like to cooperate with the transport providers as well. Citylogistik-kbh also strives to create an innovative and green third part logistic service that will reduce emissions of CO_2, noise from traffic, congestion and the use of heavy traffic within the old part of Copenhagen. The project focuses on the requests of the retailers located in the old part of Copenhagen, similar to Binnenstadservice. A major focus is put onto 3PL services, such as unpacking, returning recycling material, etc. Citylogistik-kbh combines an increased focus on optimisation of urban supply chains with the use of a UCC located outside the city. The suppliers will deliver their goods to the UCC. Deliveries to retailers will be carried out by environmentally friendly vans instead of heavy trucks, which should help reduce the negative aspects of the present transport model. The essence is to make it easier to function for a retailer in the city as well as gaining economic benefits during the implementation of the project. The 4 partners in the consortium and the Danish Transport Authority act as a steering committee on the project: The project is co-financed by the Danish Transport Authority for a 3 year period. The aim is to facilitate a permanent City logistic service in Copenhagen.
3.2) Technical main characteristics	The transport operator Citylogistik-kbh is a start-up created in 2013. The number of vehicles, their size and configuration, will depend on how many clients can be gathered and how big their freight demand and volume is. During the starting phase, at the end of 2013, Citylogistik-kbh uses one electric vehicle. It is planned to purchase another, bigger vehicle soon. The intention at this moment is to buy electric vehicles. Gas will be a possibility as well.
3.3) Success factors	Because of the consolidated receiving and shipping of goods, Citylogistik-kbh is beneficial for all actor groups: For retailers: a shopkeeper does not have to sign multiple times for his orders, but gets it all in one load. This saves him time for his staff. Since they can decide when the goods are going to be delivered, expensive shop floor can be saved. There is also the possibility of using other value adding 3PL services. For transport companies: they can deliver the goods to the distribution centre on the outskirts of the city. Thus, they don't have to enter the city themselves, which saves them time/money. It also eases the pressure of time windows and environmental zones in the inner city. For shippers: using the Citylogistik-kbh for deliveries they give their clients a much better service. Ultimately this can be used as a com-

	petitive advance for the shippers. For the city and their inhabitants: it reduces environmental pollution and makes the city more liveable due to fewer trucks and more environmentally friendly trucks/delivery vans.

3.4) Main benefits	• Reduction in noise and pollution in the inner city
	• Fewer daily deliveries
	  ○ Easier planning of shop and business staff
	  ○ Fewer disruptions in store operations
	  ○ Saved person-hours for staff in shops
	• Well-known driver helps to have a smooth unloading process
	• Less congestion
	• No need for stockholding as back room facilities
	• Offers a solution regarding untimely deliveries and storage limitation which is increasing the complexity for the retailer
	• Possible 3PL services are being offered, e.g.
	  ○ getting help for handling mail
	  ○ getting help for attaching theft devices
	  ○ getting help for price tagging
	  ○ getting the driver to return packaging material
	  ○ getting help from driver to unpack goods
	  ○ getting access to external stockholding facilities

3.5) Cost indication	Cost indications are not available yet. The business operates with the help of a public subvention received for the start-up phase. It is planned that the scheme will become self-sustained and profitable on the market. This condition of receiving a subvention during the start-up phase is very similar to other successful and long-term operational UCC schemes such as Cityporto Padova in Italy or Binnenstadservice in the Netherlands.
3.6) Barriers / Limitations	• Correlation between the partners and the possible retailers attending are crucial to the success of the project. • The motivation and engagement of the retailers has to be high because the project is aiming for establishing a new set of behavioural rules for the retailer. • The ability to change is a necessity in order to achieve success, because the shift in behaviour from a clearly economical focus towards an enhanced one dealing with the combination of economic, social and environmental aspects is a barrier. • Transport operators seeing Citylogistik-kbh as a threat instead of a potential partner. • Convincing the municipality to practise what they preach and use the service themselves.
3.7) Common practice before implementation	Before, retailers got several deliveries a day. Transport companies had to deal with time windows for delivery and/or restrictions with respect to environmental zones. Goods in the inner city was delivered uncoordinated and with big trucks with only one or a few drops in the inner city.

3.8) Motivation/problem	The main motivation was the idea to make the city centre more attractive, reduce congestion, noise and pollution. It should also get rid of large trucks in the city centre. The motivation for the private operator is to provide better services and a coordinated transport for the consignees.
3.9) Justification of practice	The practice is focussing on bringing benefits to all involved actors and is easily transferable.

4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	The only special requirement for it to transfer is the availability of a consolidation center near the city center.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The main goal is to optimize transport and logistics services or flows. This could be transferred to other domains.
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
	Regulations however would support the solution.
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 nationwide?) ☒ Yes ☐ No
	The more cities participate in the Citylogistik-kbh concept, the easier it is for shippers or transport companies to make use of the concept, because it then reaches a critical mass.
4.5) Similar cases	Binnenstadservice (Netherlands), CityDepot (Belgium).

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	http://citylogistik-kbh.dk/ Aastrup, J., Gammelgaard, B., Prockl, G., - 3PL Services in City Logistics – A User's perspective Pedersen, Dennis Bo – Master Thesis – Change Management in Citylogistik-kbh

5.3) Contact for further details	Christina Bech Godskesen Andersen Project Manager/Research Assistant, Citylogistik-kbh Department of Operations Management Copenhagen Business School Solbjerg Plads 3,5.21, 2000 Frederiksberg, Denmark Cbga.om@cbs.dk Dir. (+45) 3815 2218 Mobil: (+45) 4185 2199
5.4) Date of review	18.10.2013
5.5) Pictures	 **Figure 11: Logo and illustration of Citylogistik kbh in Copenhagen**  **Figure 12: Final parcel delivery with Citylogistik-kbh**

5.6) Involvement of SME	Citylogistik-kbh is operated by a SME. Is has been found easier to introduce the concept from a SME rather than a larger existing company.
5.7) Impact on SME	An SME is thought to be more willing to adopt new ways and being open to introducing new services. They can benefit from the creation of a new concept, which is believed to potentially become a sustainable business in time (possibly by the end of the 3 year demonstration period). As described, the concept could be transferred to other cities/regions/countries and as a result of that, there is also a potentially growth perspective to Citylogistik-kbh.

3.1.8 Electrically assisted tricycle for parcel deliveries in France

1) Basic information	
1.1) Identification CL1_052	La Petite Reine : Parcel deliveries in urban centres with electrically assisted Cargocycles
1.2) Cluster	CL1 (Urban logistics)
1.3) Responsible authors/	Christophe Rizet (IFSTTAR)

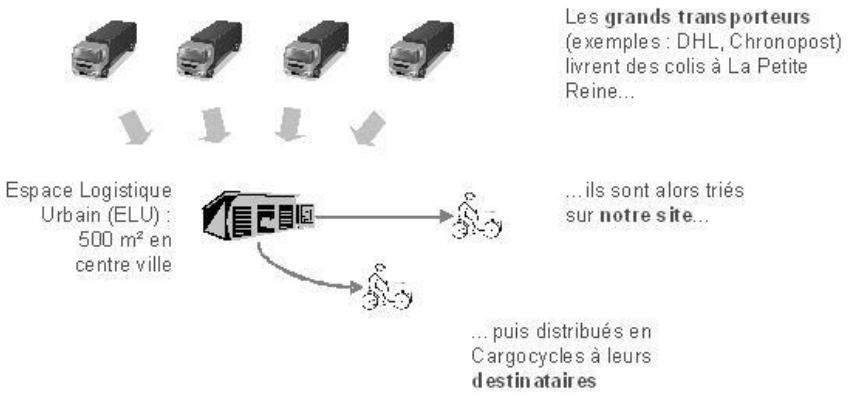
2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Retail, freight operator, last mile delivery.
2.3) Geographical Area	4 French towns : Bordeaux, Lyon, Paris and Toulouse
2.4) Implementation status	To what extend is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
2.5) Date of implementation	La Petite Reine started in 2001 in Paris
2.6) Link to other clusters	• Cluster 2 : 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
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 …electrically assisted cargo tricycle
	Before: 100% diesel vans; after: 100% battery electric vehicles: Cargocycles
2.9) Supply chain elements	Freight transport operation. Manufacture of electric Cargocycle vehicles. Additional small consolidation centre close to the delivery area. High density of customers in the delivery area.

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: Social entrepreneurship
	For both actor groups: ☒ Limited climate change ☒ Reduced emissions ☐ Conservation of resources ☒ Others? Please specify: …low noise	
	Creation of a new company with job creation and employment effects	
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	La Petite Reine is based on a new concept of vehicle : the cargocycle, an electrically assisted tricycle adapted for the last mile delivery. It is used to provide delivery services for carriers and retailers in four French towns. Parcels arrive in town by trucks ; they are unloaded by the truck driver in a dedicated urban logistic area (proximity terminal) where cargocycles are loaded for delivery to the consignees. The company started in Paris in 2001; After its success in Paris, La Petite Reine opened in Bordeaux, Lyon and Toulouse. A majority of the company shares (51%) is now belonging to Star Service, a freight	

	transport group specialised in deliveries.
3.2) Technical main characteristics	The electrically-assisted cargo tricycles are manufactured in France by Lovelo http://www.lovelo.com/. The electric assistance motor is non-polluting and completely adapted to an urban environment thanks to its ergonomics. It has an autonomy of a day of delivery, a payload up to 180 kg of goods, an empty weight of 110 kg and a volume of 1,5 m³. It has access to the road network, to the bus lanes and to the bicycle paths. It is handy and little cumbersome: 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 (Picture below).
3.3) Success factors	Positive image and positive support from the local authorities. Business contacts with carriers and retailers.
3.4) Main benefits	• Less congestion in City centres • Low emissions (local pollutants and GHG) • Low noise • Employment
3.5) Cost indication	Since it started in Paris in 2001, La Petite Reine has opened in 3 other French cities and the concept seems to spread all over the world.
3.6) Barriers / Limitations	The price of renting a centrally located logistics depot is very high and is a major barrier for running operations starting from the city centre. The City of Paris was allocating space in one of its underground parking at a price well below standard market rates per m^2 in that area.
3.7) Common practice before implementation	For urban parcels deliveries, the main vehicle used was and still is the diesel van.
3.8) Motivation/ problem	Deliveries in pedestrian zone, congestion, air quality, noise and image problems of the deliveries.
3.9) Justification of practice	Consolidation and final distribution of goods using electric vehicles in centrally located high streets and pedestrian area is becoming a profitable business model. Good image for the operators and the shippers is a reward. Better air quality, lower noise and emissions, and very good safety records are substantial effects beneficial for health and environment in cities, in line with all major transport policies at European, National and local level.
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 density of consignees needs to be high. There is a need for a small local logistical depot in central area. The vehicle type has to be accepted for road usage by the country road authorities.
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; Need for an affordable logistics depot in central area
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 it can be used in other cities but It is mainly for densely populated city centers, not for rural areas ☐ No
4.5) Similar cases	Many other cycle freight projects and electric vehicle projects for retail deliveries in Europe (including Gnewtcargo in London) and worldwide.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ? ☐ No ?
	High transferability, large growth potential, high market acceptance, substantial political implications
5.2) References	http://www.lapetitereine.com/fr/index.php
5.3) Contact for further details	Christophe Rizet christophe.rizet@ifsttar.fr Christophe Gomez christophe.gomez@lapetitereine.com
5.4) Date of review	27 November 2013
5.5) Pictures	**Figure 13: Electrically assisted tricycles manufactured by La Petite Reine** 

	Figure 14: Cargocycles at the underground parking depot of La Petite Reine in Paris  **Figure 15: Logistics scheme of the last mile distribution with Cargocycles operated by La Petite Reine** 
5.6) Involvement of SME	La Petite Reine is an SME manufacturing electric tricycles and running operations in French cities.
5.7) Impact on SME	Further growth prospects of this type of solution are high.

3.1.9 Marleenkookt meal deliveries in Amsterdam

1) Basic information	
1.1) Identification CL1_155	Marleenkookt meal deliveries in Amsterdam
1.2) Cluster	1 (urban freight)
1.3) Responsible authors	Mobycon
2) Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	(a single) Local retailer
2.3) Geographical Area	The Netherlands, Amsterdam
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ■ Best Practice
	It is a very good example of an innovative company with an innovative transport solution, which is already copied in other places.
2.5) Date of implementation	November 2011
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
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 …
	No use of vans or scooters, which are normally used to deliver in short distances.
2.9) Supply chain elements	Transport, last mile delivery

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) 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	MarleenKookt cooks meals for those who are short on time or have other reasons not to cook by themselves. The meals are later on delivered to the consumers by e-cargobikes. An average delivery trip takes 30 kilometres and the daily average amount of cooked meals is between 10 and 15. In total Marleenkookt has seven e-cargobikes, all developed by one company.
3.2) Technical main characteristics	Electric driven cargobikes with a 60 kilometre range. The e-cargobike costs between €3500,- and €4000,-.

3.3) Success factors	• Simplicity; clear restrictions concerning ordering and delivery range. • E-cargobikes can reach places that cars cannot. • Easy and cheap maintenance of the vehicles compared to alternatives such as cars and scooters. • It fits the companies' profile
3.4) Main benefits	• Financial: Less fuel costs compared to deliveries with gasoline. Less maintenance compared to cars and scooters. • Benefits in the field of services: It fits the company's profile and therefore meets costumers' expectations. • Benefits for society: lower emissions, less noise, less congestion
3.5) Cost indication	Each e-cargobike costs between €3500 and €4000. The maintenance costs of the vehicles are low, especially compared to cars and scooters. The tires are most often checked on quality.
3.6) Barriers / Limitations	The (many) uncertainties regarding capabilities of the e-cargobike had impact on Marleenkookt's operational reliability. Many possibilities of the e-cargobike were unknown or uncertain. Before, there were only regular cargobikes and e-bikes for transporting people, but no e-cargobikes. Now, two years later, experiences took away a lot of uncertainties. There is a better insight of the capabilities. For example, now they can pre-emptive maintain the e-cargobike, which is better for the durability of the vehicles and can prevent serious damages.
3.7) Common practice before implementation	Most local (food) retailers deliver small orders by van, car or scooter.
3.8) Motivation/problem	Sustainable transport fits the companies' profile
3.9) Justification of practice	A best practice is characterised by the following attributes: 1. Best practice includes an innovative approach beyond the common practice 2. Best practice addresses both business and policy objectives 3. Best practice have considerable and measurable positive effects on strategic targets 4. Best practice should be transferable to other companies, initiatives or contexts The approach of Marleen Kookt fulfils all of the above criteria (in particular numbers 1, 2 and 4)
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ■ Yes ☐ No
	Yes, only limiting factor is the distance to be covered. Up to 60 kilometres (return trip) is no problem.

4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	Yes, every actor/industry that has to deliver goods with a limited weight or size and at a not too far distance.
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
	No specific policies, regulations et cetera are required. But a restrictive policy on delivery vehicles (time window, emission limits, etc), might be beneficial for adoption of e-cargobikes.
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 practice can be used within a different area, with approximately the same size. In many inner cities this practice can contribute to lessen inner traffic movements.
4.5) Similar cases	e-cargobikes are used in many different places, whether for delivery of goods, passengers or for the delivery of services. In Groningen Cooking just started with delivery of food by e-cargobike. Joey's Pizza in Germany delivers pizza's by e-cargobike and a drugstore in The Netherlands delivers medicine by e-cargobike. The project PRO-E-BIKE has an extensive overview of the use of e-cargobikes for the delivery of freight, passengers and services.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	MarleenKookt is a good example for other food delivery companies, from traditional pizza to extensive breakfast. But similarly the e-cargobike can be used for other types of home-delivery, such as e-commerce parcels, flowers, cakes, etc.
5.2) References	http://www.marleenkookt.nl/
5.3) Contact for further details	*Contact details: Joris Keijzer* *Tel. 06 33666633* *Fax -* *E-mail Joris@marleenkookt.nl* *Website http://www.marleenkookt.nl/*
5.4) Date of review	27 Nov 2013

5.5) Pictures	  **Figure 16: Markenkookt e-cargobikes**
5.6) Involvement of SME	Most companies involved in home-deliveries are SME, with a local clientele.
5.7) Impact on SME	• Since e-cargobikes are very flexible, local retailers can deliver their goods to customers anytime and anywhere. • Since most people react positive on sustainable businesses, the retailers most likely also improve their image towards costumers. • Investment in an e-cargobike is much lower then investment in a car. The same applies for maintenance, insurance, road tax, etc. • For an e-cargobike no driving license is required, which is different in case of scooters and/or cars/vans. This makes It cheaper for the company to hire staff.

3.1.10 Emakers urban freight delivery solution with clean vehicles

1) Basic information	
1.1) Identification	Emakers urban freight delivery solution with clean vehicles
1.2) Cluster	1 Urban Freight
1.3) Responsible authors	Jacques Leonardi, University of Westminster Gonzalo Fornies, Emakers
2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transport operator
2.3) Geographical Area	Spain (Madrid, Barcelona, Sevilla, San Sebastián, Murcia, Málaga) UK (London)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	Startup business
2.5) Date of implementation	What year (or more specific date if possible) was the new solution implemented? December 2012
2.6) Link to other clusters	• Green Logistics (CL2) • E-Freigth (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
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 …
	Electric vehicles and bikes only
2.9) Supply chain elements	Transhipment depot, transport operations.
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
	For private actors: ☒ Increased efficiency / productivity of logistics processes ☐ Increased company profitability ☐ Minimisation of financial risks ☐ Increased competitiveness ☒ Increased quality ☒ Image

	☐ Highest safety and security ☐ Others	☐ Increased safety and security ☐ Others
	For both actor groups: ☒ Limited climate change ☒ Reduced emissions ☐ Conservation of resources ☒ Others? Please specify: low noise	
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	What Emakers offer to the market is an efficient B2C solution based on technology, unique operations and sustainable vehicles. What Emakers' technology offers is a much better interaction with the consignee. Big couriers tracking system answer to the question: Where is the parcel? And Emakers' interaction system answers to the question: When will I receive my parcel? It also allows the consignee to select between more precise and timely delivery options: Morning, Afternoon and Evening. Emakers want to replicate this business model in all major European cities partnering up with last mile delivery specialists in every city. E-tailers (online retailers and e-commerce businesses) need national, European and worldwide delivery networks. This service is covered by large international players like UPS, DHL, etc. What Emakers offers to E-tailers is the possibility to do something different with deliveries: • Greater service at the same cost, • be green to be seen and • a good image of the drivers. Emakers is has managed to work with international brands like: Nes-presso, Fnac, Massimo Dutti, PullandBear, Stradivarius, Bershka, etc.	

3.2) Technical main characteristics	Deliveries with cycles and electric vehicles. Use of a dedicated IT support. Network of operations in different cities. Capacity to extend the business to new cities.
3.3) Success factors	All e-tailers like the idea of sustainable delivery, but getting operational and systems ready just to offer green delivery in one city is not viewed as a profitable investment. Emaker is successfully expanding to other cities and growing its operation volume because it adds coverage in the main European cities and better service to the green concept.
3.4) Main benefits	• Environmental and health benefits, due to the switch from diesel vehicles to clean vehicles for the deliveries
3.5) Cost indication	The solution is a business startup at an early stage, therefore even if the future growth prospect of this evolving best practice are good, it is too early to have a statement on its long term profitability. The costs of the solution are competitive on the market.
3.6) Barriers / Limitations	Financing a startup. City centre area suitable for cycling solutions. Range of the electric vehicle and of the cycles is limiting the area of distribution.
3.7) Common practice before implementation	Parcels deliveries were made using diesel vans.
3.8) Motivation/problem	The logistics provider solutions offered for the B2C market are not very efficient. What Emakers offer to the market is an efficient B2C solution based on technology, unique operations and sustainable vehicles.
3.9) Justification of practice	Use of clean vehicles in city centres is expanding but far from becoming standard in delivery operations. There is a need for an improved IT solution that would help increase the efficiency of the communication on delivery with the final customer.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Not significant
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☐ Yes ☒ No
	Not known.
4.3) Political framework	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

conditions - Regulations	transfer of the practice to another domain? ☒ Yes ☐ No
	Cargo tricycle homologation
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
	Only urban areas
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. Gnewtcargo in London, The Green Link in Paris, Ecopostale in Brussels, Txita in Donostia San Sebastian
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Emakers is an early stage, evolving Best Practice
5.2) References	www.Emakers.es
5.3) Contact for further details	Gonzalo Fornies Cerrada, Emakers director, gonzalo@emakers.es Tel: +34 93 624 24 26
5.4) Date of review	19 November 2013
5.5) Pictures	 **Figure 17: Parcels delivered by electric cycles in Barcelona**

	 **Figure 18: Emakers electric tricycle vehicle on a delivery trip**
5.6) Involvement of SME	Emakers is an SME
5.7) Impact on SME	Future growth prospects of this SME are excellent.

3.1.11 Brescia clean vehicle and city logistics scheme

1) Basic information	
1.1) Identification CL1_152	**Eco-Logis** - Urban Freight Distribution in Brescia
1.2) Cluster	Cluster 1 - Organisation and Cooperation (PPP)
1.3) Responsible authors	Carlo Vaghi, Gruppo CLAS Thanks to the contribution and input of Gruppo Brescia Mobilità, OMB International, and in particular of Mr Vittorio Serena
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	General Service Manager - Brescia Mobilità (in-house company owned by the City of Brescia) Public administration - City of Brescia, Lombardy Region Logistics Manager - OMB International Personnel Manager - Cooperativa Facchini Bresciani Platform owner - Consorzio Brescia Mercati S.p.A.
2.3) Geographical Area	Brescia, Italy
2.4) Implementation status	To what extent is the solution implemented / in operation? Please indicate and explain. ☒ fully ☐ partly ☐ planned
	Eco-Logis is the goods distribution service in the City of Brescia, managed by Brescia Mobilità (in-house company) and its partners, in operation since 2012. Deliveries for the inner city centre of Brescia are performed through an Urban Consolidation Centre (at the City's general wholesale market), where goods are sorted by destination and delivered by zero emission vehicles (full electric).
2.5) Date of implementation	2012
2.6) Link to other clusters	Cluster 2: Green 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
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 …
	Eco-Logis service is provided by 3 full electric vehicles.

<table>
<tr><td>2.9) Supply chain elements</td><td colspan="2">The main supply chain elements covered are:
Warehousing (cross-docking)
Last-mile transport and delivery</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
☒ REDUCED CONGESTION DUE TO THE CONSOLIDATION OF GOODS</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 colspan="3">3) Best practice</td></tr>
<tr><td>3.1) Description of the practice</td><td colspan="2">“Eco-Logis” is a urban distribution service operational in the urban area of Brescia (Lombardy-Northern Italy), focusing on the historical city center and its Low Traffic Zone (LTZ). The manager is Brescia Mobilità, an in-house company of the City of Brescia, in partnership with OMB International (Logistics Manager), Cooperativa Facchini Bresciani (Personnel Manager), Consorzio Brescia Mercati S.p.A. (Depot owner).

The service is operational since 2012.

Eco-Logis has been issued by appointment of the City of Brescia as a policy aimed at decreasing the access of vans in the city centre by a planning process of delivery trips, load optimisation. The aim is to contribute to the decrease of congestion and pollution in the city centre, also</td></tr>
</table>

	through the use of electric vehicles.
3.2) Technical main characteristics	Eco-Logis is based on a 400 m^2 wide Urban Consolidation Center located in the general wholesale market of Brescia (very near both a motorway exit and the city centre). The depot is endowed by 3 loading bays, and temperature controlled cells are available for a possible extension of the service to the distribution of perishable goods. The service is provided by 3 full electric vehicles (5 to 15 cubic meters volume, payload 700-900 kg each), operated by Cooperativa Facchini Bresciani's drivers, while the maintenance is provided by OMB International. All vehicles are equipped with satellite tracking & tracing devices. Each delivery can be traced from the platform to the final destination, also via web in a site accessible to clients and operators. Eco-Logis vehicles are entitled to access the LTZ freely, with no time window limitation, whilst all other vehicles must follow a time window rule for access, loading/unloading. The policy has been issued on 12/11/2012 and it is foreseen that the time window will be progressive narrower. Now the access for loading/unloading is allowed from Monday to Saturday, from 06.30 to 10.30 and from 14.00 to 15.30.
3.3) Success factors	The number of deliveries is constantly increasing since the start of operations. Eco-Logis plans to perform about 5,500 deliveries in 2013, however the average monthly performance boomed to 950 deliveries since August 2013, allowing a forecast of about 12,000 deliveries in 2014. The delivery efficiency has reached a significant indicator of 5 average parcels per delivery, sign of a constantly increasing trust by Eco-Logis customers. The panel of Eco-Logis clients include forwarders and logistic operators such as CEVA, Fercam, Artoni, GEFCO, Arco, MTN, Tardini, and fashion brands like Zara and Coin. Eco-Logis is expected to repeat the success story of Cityporto Padova, on which business model the service is based. The main success factors, like in the "parent case" are: • The location of the UCC in a strategic position, very accessible from main roads and near the city centre; • The existence of the UCC: no need for new investment in real estate; • The public ownership of the platforms and the vehicles, which ensures neutrality; • The development of a dedicated IT System for Eco-Logis services
3.4) Main benefits	Eco-Logis is expected to decrease the number of vehicles entering the city centre by 4,220 in 5 years, which equals to a decrease in total distance driven by all goods vehicles of 284,000 km. As concerns environmental benefits, emission savings of 31 tonnes of CO_2 and 19 kg of particulates PM_{10} are foreseen. These forecasts were made before the service start-up. Nowadays, Eco-Logis reports a mileage performance of 16,000 km by

	its electric vehicles. No further ex-post investigations on congestion, reduction in total number of diesel trucks and vans in city centre, and air pollution benefits have been developed so far.
3.5) Cost indication	The service has been granted in the start-up phase by the City (150,000 Euros) and Lombardy Region (50,000). The latter provided its contribution, finalised to the purchase of electric vehicles, in the framework of policy actions to promote sustainable logistics. This Lombardy Region programme includes also other solutions such as the Como SMARTFUSION case.
3.6) Barriers / Limitations	A robust consultation process has been carried out before the start-up, also through the methodological help of specific international projects like CIVITAS MODERN. It ensured a valid benchmarking of processes among other leading and following cities.
3.7) Common practice before implementation	As a common practice, diesel vehicles performed deliveries with no geographical and time limitations in the city centre of Brescia.
3.8) Motivation/problem	The introduction of the Eco-Logis service was motivated by the objective to reduce the traffic congestion and pollution of Brescia 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 Eco-Logis vans, that run with a much higher loading factor.
3.9) Justification of practice	Eco-Logis is a best practice since: • It confirms the feasibility of UCC-based goods delivery services in medium-sized cities • It gained an increasing trust by customers • It has proven as a transferable practice
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

	As in many UCC-based city logistics practices, the service has to rely upon the commitment and support of the local administration. The local transport authority has to enforce some kind of regulatory policy that has to favour the consolidation of goods in the UCC, at least extending the "fostering policy" to vehicles having the same emission standard (e.g. electric) and efficiency characteristics (e.g. operators committed to deliver at full load). Another important part of the practice is the modified access rules to the city centre at certain times, giving the electric vehicle solution a market advantage.
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 model has proven to be a replicable practice throughout several Italian medium-sized cities
4.5) Similar cases	The model has been replicated in other Italian cities, where the local City Administrations implemented (or attempted to implement) similar city logistics schemes. Those cities are: • Padova: Cityporto (the "parent" case, operational since 2004); • Aosta: Cityporto Aosta is running since 2011 • Modena: Cityporto Modena is running since 2007 • Como: Merci in Centro Como is operational since 2009 The constant increase in deliveries makes Eco-Logis service among the most promising cases in the panel.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Impact data collection and monitoring of before-after situation are missing.
5.2) References	www.eco-logis.it
5.3) Contact for further details	Mr Vittorio Serena - OMB International
5.4) Date of review	06/12/2013

5.5) Pictures	 Depot location  **Figure 19: Eco-logis UCC (depot) in Brescia**  **Figure 20: Electric van of Eco-logis in Brescia**
5.6) Involvement of SME	Some customers of Eco-Logis are SMEs
5.7) Impact on SME	The future growth prospects of such a solution are good. SMEs can benefit from such a solution either by becoming a business partner or client, or by replicating the same solution in a different city or country.

3.1.12 Citylog EMF

1) Basic information	
1.1) Identification CL1_102	Citylog EMF (efficient, modular, flexible) - Electro-Multifunction-Vehicle
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible authors	HET Hochleistungs-, Eisenbahn- und Transporttechnik Entwicklungs-GmbH
2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Construction, F&E, new drive technology (fuel cell), new materials, electrical engineering
2.3) Geographical Area	Austria (Salzburg)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	The first prototype of the Citylog EMF was ready in 2012. It was introduced in October last year at the same time as HET got presented the award “workplaces through innovations” (“Arbeitsplätze durch Innovation”) in Salzburg (Austria). Now HET works on the second demonstration-vehicle. It should drive 2014/15 in Klagenfurt (Austria). This would be the first testing phase in real terms. The technical process, certification and permission will be ready 2016.
2.5) Date of implementation	2012 (prototype ready) 2016 (serial production)
2.6) Link to other clusters	• 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
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 …
	Citylog EMF can replace the delivery vans for the last mile on inner city transports.
2.9) Supply chain elements	Freight companies, terminals, warehouses, transport
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 *For private actors:* ☒ Increased efficiency / productivity of logistics processes ☐ Increased company profitability ☐ Minimisation of financial risks

	☒ Acceptance and influence ☐ Balanced provision of goods and services ☐ Increased amenity value ☒ Highest safety and security ☐ Others	☒ 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: low noise	
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	Citylog EMF is a new type of electric freight vehicle developed in Austria by a consortium led by HET. The electric motor propulsion is fuel-cell based, and the vehicle concept consists of a series of 'self-driven' vehicles and 'trailers' that can be coupled to a train, and un-coupled for loading and unloading operations. The trials in Klagenfurt follow the prototype phase in which the technical feasibility has been demonstrated. The idea of this solution is to produce a flexible, environmentally-friendly and modular built vehicle for transportation of goods in inner cities. Especially in old city centres, freight delivery vehicles have to perform on many small streets and face ever growing access restrictions (e.g. bollards, pedestrian areas, environmental zones). The project leader HET looked for a solution to these problems. The common practice before the implementation of the Citylog EMF is that many trucks and private cars drive in the inner city areas to deliver directly to the shops, private customers and businesses, and these areas suffer from too many vehicles, poor air quality (pollutant emissions), noise, etc. If shops, restaurants and other businesses would use the Citylog EMF for their deliveries, the city centres would potentially become safer for pedestrians and cyclists, there would be lower CO2-emissions and citizens would have a better environment to live and work in.	

	The main innovations of the solution are the fuel cell drive and the electronic shaft. Both are new developments in the vehicle-manufacturing sector. For the start-up phase of the manufacturing of the first series of vehicles, the use by freight operators and wider take-up of the Citylog EMF innovative solution in inner cities, a teamwork of city-management and economic actors (including also shops, restaurants, businesses etc.) is necessary. The first Citylog EMF vehicle has been tested in Klagenfurt (Austria). As part of a project called “E-log Klagenfurt”, the Citylog EMF will be used for transportation from the local logistics distribution centre to the inner-city area. The Citylog EMF is a vehicle designed for transportation of good or persons. As well as logistics companies that need to access city centres area, the Citylog EMF can be used for transportation to and from other facilities with restricted vehicle access rules such as shopping centres, indoor transport, theme parks, mass events, stadiums, exhibition centres, tourism centres, hotels. The solution could be applied all over the world (there are currently, for example, interests from USA).
3.2) Technical main characteristics	Citylog EMF is a type of road train that uses an electronic and not a normal mechanic drawbar. Every vehicle is ‘driving’ itself. Each ‘trailer’ or ‘follower’ vehicle is led by electronic signals to follow the trajectory of the first one, like on rails, but there is no physical drawbar linking the vehicles to each other, because each vehicle is using its separate propulsion unit. Every vehicle can be linked (coupled) or unlinked from the train very quickly. It is possible to load or unload a vehicle with goods for one shop, uncouple the vehicle at the shop, leave it there during the next delivery operation, and take it again on the way back. The fuel cell uses hydrogen as fuel. Brake-energy will be saved and can be used if the vehicle needs more power (e.g. to drive up-hill). Emissions are only water vapour.Because of the single wheel drive, the single wheel control and the 360°-rotation of the four wheels of every vehicle, the whole train is extremely flexible and agile. The CityTrain can drive for- and backward and also in the square angle to the side. This can be a target especially in strait alleys, if there is no place to turn the whole train. The change from one side of the street to the other is easy with the sideward drive. The use of modern sensory eliminates accidents. The electronic shaft realize, if persons or other things stand between the vehicles. If this is the case, the vehicles behind the persons drive not until the way is free again
3.3) Success factors	The Citylog EMF is cost-efficient and price-competitive (buy + fuel). His high load-weight of 2,20 to means a lot of goods on a little, streit vehicle. Also the point “zero-emission” is a success factor. And also the flexibility is a reason, why the system works so well. The number of vehicles is very flexible and every vehicle can be linked or unlinked at every time and place.
3.4) Main benefits	• Economic benefits? Investment costs are at the same area as similar trucks with fossil

	engines. The costs per fuel (hydrogen) are about 50 cent. • Benefits in the field of services? Service and maintenance are simple. Service interval is 2 years. Repairs can be done by the owner himself (Ikea-principle – usage of simple parts, which can be changed simply) • Benefits for the society? Lower traffic in inner cities – they will be more attractive for citizens as well as for tourists • Environmental benefits: Engine is hydrogen – no emissions (only water steam), no CO_2, no noise. Hydrogen exists as a waste product in some industries or can be generated with the energy of photovoltaic.
3.5) Cost indication	1 single Citylog EMF-vehicle will cost about 30.000 € (depends on the body – e.g. simple containers are cheaper than a cooling container)
3.6) Barriers / Limitations	The main barrier is the certification and the permission. Both are enormous cost-intensive and both must be done from the first point on to the whole vehicle, because there is no vehicle to compare (especially the hydrogen-drive). Also a barrier is the electronic shaft. As at the single vehicle, also at the electronic shaft not the technic as such is the real problem, but more the permission – new things must be tested and controlled more than other.
3.7) Common practice before implementation	Deliveries by diesel vans and trucks are main practice.
3.8) Motivation/problem	The motivation for the development of Citylog EMF was the installation of bollards in the city centre of Salzburg. Only vehicles with special authorisation can be driven to the shops there at present. The Citylog EMF vehicle solution is very adaptive, so that it can drive through the bollards without difficulty.
3.9) Justification of practice	The Citylog EMF can be considered a Best Practice, because many cities have a problem with too much traffic in the inner city (special problem at pedestrian areas). If shops, restaurants etc. in inner cities use the Citylog EMF for the delivery, they are much more flexible at the one hand. At the other hand, less traffic means more pedestrians, which in turn means more potential shoppers.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Certification Europe: TÜV (MOT), USA: UL Citylog EMF is on sale in Europe and the USA. At the moment the manufacturers have interested parties for about 1.000 vehicles. Before the manufacturer is going to go into the next step of the serial production, a demonstration-prototype will be used in Klagenfurt (Aus-

	tria) for about 1 year. So it can be seen how it works under real business conditions (e.g. in winter or with full-load).
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	The body can be changed to seats – so not goods, but persons can be transported, e.g. in theme parks, stadiums, mass 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
	Lobby for hydrogen-drive; hydrogen-petrol stations; environment-zones in inner cities
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
	Originally the system was created especially for old city centres with small street (like Salzburg – Getreidegasse), but it can be used in all other cities, for indoor-transport, at theme parks and many other places more.
4.5) Similar cases	There are no similar cases, because it is a transportation vehicle for 2,2 tonnes per vehicle, which can be linked to a train of more vehicles. And the drive is a fuel cell, means hydrogen is the petrol, with the same load capacity as diesel-trucks, but zero emissions.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The project should be considered for in-depth review, because it is an extremely futuristic and environmental-friendly solution for the last mile on the transportation chain.
5.2) References	www.het-engineering.com http://www.citylog.at/index_english.html
5.3) Contact for further details	Mrs. Mag. Sonja Kern Sonja.kern@het-engineering.com +43 676 840 722 201
5.4) Date of review	17/06/2013

5.5) Pictures

	 **Figure 21: Citylog EMF vehicles in operation**
5.6) Involvement of SME	Phormolog OG is involved in the project as designer. Phormolog is an industrial design company, so they work together with our engineers and create a good-looking functional vehicle
5.7) Impact on SME	Phormolog OG is a 2-persons company. So, we have only those two contacts. They have no long chain of commands. Phormolog can benefit, because they design a world new transport-solution, which can (and should) be uses all over the world.

3.1.13 EMEL loading/unloading regulation in Lisbon

1) Basic information	
1.1) Identification CL1_072	EMEL loading/unloading regulation in Lisbon
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible review partner	ITENE
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	- Municipality, EMEL - Transport operators. Any branch of industry - Shippers and freight receivers (shopkeepers) - Private cars users - Public Transport - Chamber of Commerce
2.3) Geographical Area	Portugal, Lisbon
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	It started on Dec 5th 2011 and have lasted until March 2012
2.6) Link to other clusters	eFreight
2.7) Topics covered	***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	The solution involves mainly the elements of: - Transport - 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: …
3) Best practice	
3.1) Description of the practice	The practice consists of developing a new solution of the congestions and unloading problems that helps mitigate the externalities identified in the city. The purpose of the EMEL's demo is to find solutions by: • Testing and identifying technologies for controlling and monitoring cargo activities (loading/unloading) in the urban context. • Providing evidence and the grounds for developing the Municipal Regulation on loading and unloading operations. • Applying the chosen technology to the rest of the city. The practice consists in the development and implementation of two technological based schemes: • Adapted Parking Meters that issue special tickets for 30 minutes of unloading/loading operations when the users expose a contactless card that activates the system; • Loop Vehicle Detection sensors that will be installed on the ground; these sensors detect the presence of a vehicle in the parking places and send a message to EMEL's control centre, which then gives the operator 30 minutes to finish the operation and leave the parking place. In order to assess the solutions being tested, the following actions will be accomplished in parallel with the demonstration: • Identification of the cost structure and benefits of both technological schemes; • Evaluation of the current levels of satisfaction (for shoppers and transport operators); • Collection of information for assessing and monitoring of the demo.
3.2) Technical main characteristics	Adapted Parking Meters that issue special tickets for 30 minutes of unloading/loading operations when the users expose a contactless card that activates the system; Loop Vehicle Detection sensors that will be installed on the ground; these sensors detect the presence of a vehicle in the parking places and send a message to EMEL's control centre, which then gives the operator 30 minutes to finish the operation and leave the parking place.
3.3) Success factors	Acceptance of the users will be key for a broader implementation.

3.4) Main benefits	With the implementation of the new scheme, EMEL expects to reach the following results: • a strong reduction in the number of parking infractions; • a reduction in the average duration of freight operations; • an increase in transport operators' satisfaction; • an increase in shopkeepers' satisfaction;
3.5) Cost indication	Not available.
3.6) Barriers / Limitations	There is no national legislation to regulate loading/unloading activities, nor efficient enforcement to regulate the traffic and parking. As a consequence, significant conflicts exist between the urban freight operations, pedestrians, private car users and public transport.
3.7) Common practice before implementation	• Unregulated loading/unloading activities • Road congestion and often blockage of roads (when trucks stop on narrow streets for quick loading/unloading activities) • Illegal parking (like trucks and vans parked on sidewalks, double-parked, or parked on places for private cars, and private cars parked in places for freight operations).
3.8) Motivation/problem	The City of Lisbon has currently growing problems with unregulated loading/unloading activities, with road congestion and often blockage of roads (when trucks stop on narrow streets for quick loading/unloading activities) and illegal parking. Example of such illegal parking are when trucks and vans parked on sidewalks, double-parked, or parked on places for private cars, and private cars parked in places for freight operations). Furthermore there is no national legislation to regulate loading/unloading activities, nor efficient enforcement to regulate the traffic and parking. As a consequence, significant conflicts exist between the urban freight operations, pedestrians, private car users and public transport.
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 a solution for efficient and effective monitoring of loading/unloading 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
	It could be done in any context in which you want to control parking times and improve the system efficiency this way.

4.3) Framework conditions and regulations	Are there political or regulatory framework conditions relevant / necessary for implementation of the case? ☒ Yes ☐ No
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
	Can be used for all kind of loading/unloading zones.
4.5) Similar cases	Vienna iLadezone is a very similar concept using IT in support of loading bay management in central area of the city. But, opposite to EMEL, the solution of iLadezone has not been extended to a larger scale operational level.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The case is implemented and it is possible to obtain more details
5.2) References	EMEL – Empresa Pública Municipal de Mobilidade e Estacionamento de Lisboa, e.e.m.Centre d' Innovació del Transport (CENIT) http://www.straightsol.eu/demonstration_G.htm
5.3) Contact for further details	EMEL – Empresa Pública Municipal de Mobilidade e Estacionamento de Lisboa, e.e.m. Mobility and New Projects Department Óscar Rodrigues, o.rodrigues@emel.pt Nuno Sardinha, n.sardinha@emel.pt
5.4) Date of review	July 2013
5.5) Pictures	**Figure 22: Adapted parking meter in Lisbon** 

	 **Figure 23: Vehicle detection sensor (about the size of a mobile phone)**
5.6) Involvement of SME	SMEs such as small operators are targeted as users.
5.7) Impact on SME	SMEs such as independent shops and small logistics operators will benefit as users of the solution especially from better loading bay availability

3.1.14 GOFER cooperative system for freight management and regulation

1) Basic information	
1.1) Identification CL1_125	GOFER cooperative system for freight management and regulation
1.2) Cluster	1 (Regulation, IT support for urban routing & scheduling)
1.3) Responsible authors	Solveig Meland, SINTEF 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 groups are involved? Name all possible. The Norwegian Research Council sponsored this research project involving national and local road authorities, municipalities, terminal-and freight operators, technology suppliers and R&D organisations. - Local authorities/Road operators: Olso, Bergen and Trondheim municipalities. Rogaland County, Trondheimfjord Intermunicipal Harbour (TIH), National Public Roads Administration (NPRA) - Research Institutes/Universities/Technology suppliers: SINTEF, NTNU, Q-Free, Triona - Associations: ITS Norway, Norwegian Logistics and Freight Association (LTL) - Freight/Terminal operators: Bring, CargoNet
2.3) Geographical Area	From which country (and city) does the practice originate? Norway (Trondheim and Oslo)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	GOFER is a project co-financed by The Research Council of Norway. Its main objective 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, in a similar way as the air control manages airplanes approaching or leaving an airport. Three separate demonstration have taken place between November 2011 and January 2012: - A live demonstration on the 500 km route from Oslo to Trondheim - Heavy vehicle driving simulator to study heavy vehicles prioritising measures in urban areas - A simulation model for access to the Alnabru terminal area in Oslo This BP case describes the live demonstration and the driving simulator.
2.5) Date of im-	What year (or more specific date if possible) was the new solution im-

plementation	plemented? GOFER ran from 2009-2012.
2.6) Link to other clusters	• Are there existing connections to another cluster topic? • Can there be future links to other cluster topics? Cluster3 eFreight
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

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 …	
	Eight heavy duty vehicles from the Norwegian transport operator Bring took part in the live demonstration.	
2.9) Supply chain elements	Terminals, transport, 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: Better data and knowledge about freight	*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: Low noise	
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: Improvement of driver working conditions	
3) Best practice		
3.1) Description of the practice	The GOFER project started in 2009 with the idea of developing concepts based on cooperative systems which facilitate the control and management of heavy freight vehicles, including reducing their expo-	

sure to queuing situations, and giving them priority to parts of the road network under certain conditions. After a study of user needs and requirements in the early phase of the project, three demonstration ran between November 2011 and January 2012:

- A ten-week long live demonstration of a cooperative information system with eight heavy vehicles on the 500 km route from Oslo to Trondheim
- Tests in a Heavy vehicle driving simulator to study heavy vehicles prioritising measures in urban areas
- A simulation model for access to the Alnabru terminal area in Oslo

This BP case describes the live demonstration and the driving simulator.

The demonstration activities in GOFER were not primarily a test of technology, but demonstrations of services and functionality. This was an important basis for the prioritising and delimitations made during the design of the demonstrations. At the same time, the objective was to establish a 'win-win' situation, where all participants could benefit from taking part.

a) The live demonstration functionality included:

- Eight heavy duty vehicles from the Norwegian transport operator Bring.
- Communication between drivers, operator and data system, with updated information about conditions along the route
- Distribution of driver-initiated messages ('road messages for professionals')
- Directions/recommendations of route, based on information about vehicle, cargo and destination in Trondheim
- Predictions of driving time/time of arrival, based on formulas developed in the Speed model project (speed prediction model for heavy vehicles based on large quantity of GPS seed reported data and geometry data made available from the National Road Data Bank by the Norwegian Public Roads Administration).
- Remaining required resting time, based on the logged GPS data
- Example of booking of resources (gate/slot time at terminal)
- Information to terminal about approaching vehicles, including estimated time of arrival (web site)
- Logging of GPS data for calculation of environmental indicators

135 trips were registered, 138 driver-initiated messages were sent (in average 17/driver)

b) A driving simulator for heavy vehicles was used as a supplement to the 'live' demonstration, and included a functionality that is hard to demonstrate in real traffic. The test focussed on the effects of prioritising heavy vehicles through:

- Access to PT lanes during between-peaks periods
- Green wave in traffic lights during low traffic periods

The test was carried out in January 2012 by seven experienced drivers, using an updated description of the road network and traffic con-

	ditions for a 7 km section of the southern main access road to Trondheim.
3.2) Technical main characteristics	What are the technical main characteristics? a) Live demonstration: • Eight heavy duty vehicles • On board equipment (OBE): Samsung Galaxy Tab 7.0. for exchange of information between drivers involved in the demonstration, drivers and the terminal, and between the road authorities and the drivers. Drivers could receive information, make choices and enter information to the system. • Data system developed in the project based on a free or open source software (Android, Java, PostGIS).The system is based on the ARKTRANS definition of roles. • The data system included: detailed information about the vehicle, destinations and road links. Public road messages were made available through the information platform TRIP (Transport Related Information Platfrom). This including information on weather conditions, road mappings, road messages and speed limits. • Pre-defined 'driver messages' were set. • Website showing vehicles' activities. Google Maps was used as background for location of the test vehicles and messages along the route. • Data communication between the OBEs and the data system was carried out using GSM/EDGE. • There was no 'down-time' of the data system during the test period (16 November 2011-31 January 2012). • A designated web site for the live demonstration gave an overview of active vehicles and GOFER messages in the demonstration at all times. • As part of the evaluation process, the drivers taking part in the demonstration were all interviewed at the end of the pilot. The interview included four main parts: a) about the driver and experience with information systems and technology; b) about the equipment and functionality of the information system; c) about the various types of information included in the test; d) an overall assessment of the demonstration and the information tested. b) Driving simulator: Creating a win-win situation in a demonstration where participation is voluntarily meant also applying some compensating measures. Initial plans were to include real-life prioritizing with access to public transport lanes and green waves in traffic signals, but this was unfeasible. As an alternative, a driving simulator was used to investigate the effects of traffic management measures giving priority to heavy freight vehicles: • Access to public transport lanes during the daytime between-peaks period. • Green waves in traffic lights during low-traffic periods. As many of the freight vehicles arrive in Trondheim during the night, this measure was tested in a night-

	time situation. The test runs in the driving simulator provided logged data on vehicle position, speed, acceleration and lane position, as well as more detailed data about the vehicle. Seven experienced drivers participated in the experiment. They were interviewed after each test round. The prioritizing measures were implemented on the road sections with speed limits between 50 and 60 km/h.
3.3) Success factors	What are the main success factors of the practice? Why does it work so well? • The GOFER systems holds potential for positive effects on efficiency and predictability for the transport industry, urban environmental issues, traffic safety, and work conditions for the drivers. • The technology required is already at hand. The GOFER system is based on off-the-shelf equipment and **free or open source software**. The system is prepared for communicating with real booking system, and more complex route guidance criteria (i.e. vehicle characteristics). • GOFER is a **collaborative system** allowing for information exchange. • The test drivers' assessment of a range of information types and measures giving priority to heavy vehicles, suggest several options for compensating for restrictions inflicted on them by a truck management system.
3.4) Main benefits	What are the main benefits of the practice? General • A full scale introduction of the GOFER system was predicted to have positive effects on heavy vehicles drivers' work situation, traffic safety and the environment. • Results from the demonstration will be used to contribute to the development of new information services specifically aimed at the drivers of heavy vehicles. Data from the position logging and calculated driving times will be used to further develop the tool for calculating driving time for heavy vehicles on the Norwegian road network, and to seek to further develop tools for calculations of the fuel consumption and emissions from heavy vehicles. • The Norwegian Public Roads Administration considers the results from the GOFER demonstration to be relevant for many of their areas of responsibility. Driver –initiated messages about road conditions can be a useful source of information. They would be also interested in following up the possibilities to use a GOFER-like system for booking secure trick parking places. Live demonstration • Drivers participating in the demonstration considered messages about recommended route and information about the waiting area and slot-time to be very useful as instruments to prevent heavy vehicles from being stuck in queues related to terminals in urban traffic. • Drivers' emphasis was on benefits to travel time and traffic safety.

	• A system like GOFER could provide more predictability to the drivers and the terminal operators, and time spent in queues could be transformed to resting time or be spent on other tasks. • Bring considered the live-demonstration to be a further development of navigation system, with an 'online' future. Bring also sees the possibility to include available models of eco-driving in the systems. Driving simulator • Positive effect of access to public transport lane on stress level of the driver. • Strong improvement to drivers' working conditions with access to green waves of traffic lights during low traffic periods. • The effect of access to public transport lanes was perceived by the drivers as the most efficient prioritising measure. • The potential for time savings was much bigger in the between peaks-period than in the low traffic period. For the between peaks period, the scenario with access to PT lanes resulted on a 40% reduction on average driving time. For the low traffic situation, the green wave reduction resulted on a reduction of 20% on average driving time. This confirmed the perception of the drivers in relation to the efficiency of both prioritising measures. • The average speed was affected correspondingly: For the between peaks situation, the average speed increased from 17 km/h in the base scenario, to 30 km/h in the scenario with access to public transport lanes. For the low traffic situation there was an increase in average speed from 33 km/h to 52 km/h. Green waves also result in a more even speed profile, which is a positive effect in terms of emissions, but also gives less traffic noise during evening and night time. • Most drivers fund environmental effects to be a major argument for introducing the measures included in the test. The results confirmed this. Research show that the emissions from heavy vehicles increase when vehicles are forced to keep a low or uneven speed profile.
3.5) Cost indication	Not available
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed? The GOFER demonstration activities have far from covered all aspects of a fully working cooperative traffic management system for individual heavy vehicles. Through the user needs and requirements assessment, a wide range of conditions affecting the possibility for a GOFER system to succeed were identified. These factors include physical infrastructure (i.e. provision of suitably located resting-holding areas close to city or terminal areas), regulations and laws (i.e. finding good combinations of priority policies and measures), models for cooperation (i.e. responsibilities different organisations: who should be the system owner?), technology and systems for exchange of information (system requires a reliable information flow). As a concrete example of this pilot, access to public transport lanes was not allowed due to needs for changes in regulation, while priori-

	tizing by use of green waves in traffic lights was too costly and difficult to implement. That's why a simulator was used as a second best option.
3.7) Common practice before implementation	This was a demonstration project. No collaborative and/or priority systems were implemented before.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice? The user needs and requirement assessment showed that the common denominator for all involved parties was a wish for increased efficiency within their own area of responsibility: • Public authorities: reduction of queues and emissions, and improved road safety. • For transport practitioners: capacity utilisation and drivers' security • For terminal operators: traffic through-put in the terminal, with correct vehicle arriving at the right time, and the environmental effects of this.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? • Compared to other systems, GOFER is an open source system allowing the exchange of information. • Live/simulation tests with heavy freight vehicles and cooperative systems are still limited (i.e. previous cases include Smartfreight http://www.smartfreight.info/, Freilot http://www.freilot.eu/). • A system like GOFER could in the future be implemented at city-region/city level. • As shown in the live demonstration, GOFER allows to improve efficiency of freight transport and traffic flow, leading to beneficial impacts for both public authorities (less congestions) and operators (less time and thus less costs per hour).
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)? • Access to and quality of information is crucial: the system requires a reliable information flow which provides correct and sufficient information at the right time about traffic conditions and events (real-time), information about the vehicle, cargo, destination and planned time of delivery.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No

	Priority assignment for other type of vehicles (i.e. public service).
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
	Information/data provided by the Norwegian Public Roads Administration could be used in other areas other than Oslo-Trondheim.
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. Freilot http://www.freilot.eu/ . GOFER is different since it's a collaborative open system.
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 best practice.
5.2) References	References and sources used to provide the given information Meland S., Engen T., Mausetthage, C., Rennemo O.M. (2013). Cooperative System for truck guidance and control –is a win-win situation possible? Proceedings of the 13th WCTR, Rio de Janeiro. Engen Y. and S. Meland (2012) Can a driving simulator be used to investigate traffic management measures for heavy vehicles? Proceedings of the 40th European Transport Conference, AET, London. http://www.etcproceedings.org Meland S., Mausethagen C. and Rennemo O.M (2012) Demonstration of a cooperative information system for heavy vehicles. Proceedings of the 40th European Transport Conference, AET, London. http://www.etcproceedings.org GOFER –a cooperative system for freight management and regulation Solveig Meland, SINTEF. Presentation at the POLIS Annual Conference 2012, Perugia, Italy. (last consulted 11/09/2013) http://www.polisnetwork.eu/uploads/Modules/PublicDocuments/solveig-meland---gofer.pdf http://www.sintef.no/home/Freetext-search/?query=gofer (last consult-

	ed 11/09/2013) http://www.youtube.com/watch?v=VlZ27zXWXCU (last consulted 11/09/2013)
5.3) Contact for further details	Solveig Meland, Senior research scientist, SINTEF Email: solveig.meland@sintef.no
5.4) Date of review	Latest date of update of this format (09/10/2013)
5.5) Pictures	GOFER GOdstransportFremkommelighet på Egnede Ruter GOFER Project logo  **Figure 24: Display of on-board equipment used in the live demonstration:** Samsung Galaxy Tab 7.0  **Figure 25: Example of daytime and night-time traffic scenarios used for the test in the driving simulator**
5.6) Involvement of SME	No SME involved in the trials
5.7) Impact on SME	SMEs can be a potential user benefiting from the implemented system through an improved performance.

3.1.15 FORS Fleet Operator Recognition Scheme

1) Basic information	
1.1) Identification CL1_153	FORS Fleet Operator Recognition Scheme (Transport for London)
1.2) Cluster	CL1
1.3) Responsible authors	Jacques Leonardi (UoW)

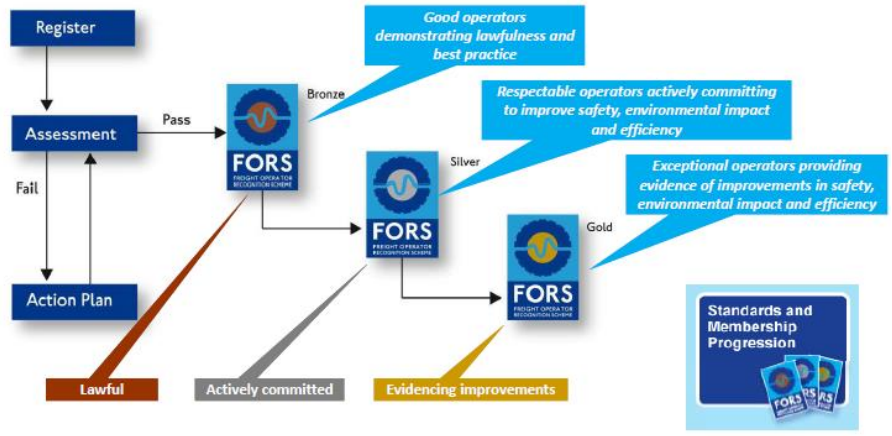
2) Scope of practice	
2.1) Approach	☐ Private approach ☒ Public approach ☐ Public & private appr.
2.2) Actor classification	Local Authority; Road freight operators
2.3) Geographical Area	UK (London)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	About 30% of all road freight vehicles of London are registered on FORS in 2013
2.5) Date of implementation	What year (or more specific date if possible) was the new solution implemented? Start of the planning in 2006, implementation started in 2008.
2.6) Link to other clusters	• Connections to another cluster topic? Green logistics CL2 • Can there be future links to other cluster topics? E-freight 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
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 …
	Owners and operators of road freight vehicles operating in London are targeted by the FORS programme.
2.9) Supply chain elements	Fleet managers in private businesses and public sector institutions; transport operations.
2.10) Which targets can be supported by the implementation?	*For public actors:* ☐ Efficient public spending ☐ Ideal utilisation of infra-structure ☐ Competitive logistics and transport system ☐ Acceptance and influence ☐ Balanced provision of good and services *For private actors:* ☐ Increased efficiency / productivity of logistics processes ☐ Increased company profitability ☐ Minimisation of financial risks ☐ Increased competitiveness ☒ Increased quality ☒ Image

	☐ Increased amenity value ☒ Highest safety and security ☐ Others	☒ Increased safety and security ☐ Others
	For both actor groups: ☒ Limited climate change ☒ Reduced emissions ☒ Conservation of resources ☒ Others? Please specify: Compliance	
	Other: Compliance of the operators with current regulation.	
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: Trust that the operator certified with FORS bronze complies with the truck regulations. The operator benefit from FORS with public recognition.	
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**. FORS, the London Fleet Operator Recognition Scheme is a behavioural change initiative that is targeting commercial operators, local authorities and procurement specialists, enabling operators demonstrate their improvements FORS drives motivation with a membership scheme, accredited standards, helping operators to secure work, and to get recognition through awards and publicity. FORS generates actions as it requires business to meet standards and requires operators to demonstrate their safety, environmental and business efficiency performance improvement. FORS supports industry change with guidance, tools, training and workshops FORS also demonstrates the outcomes of the changes by getting evidence from the operators.	

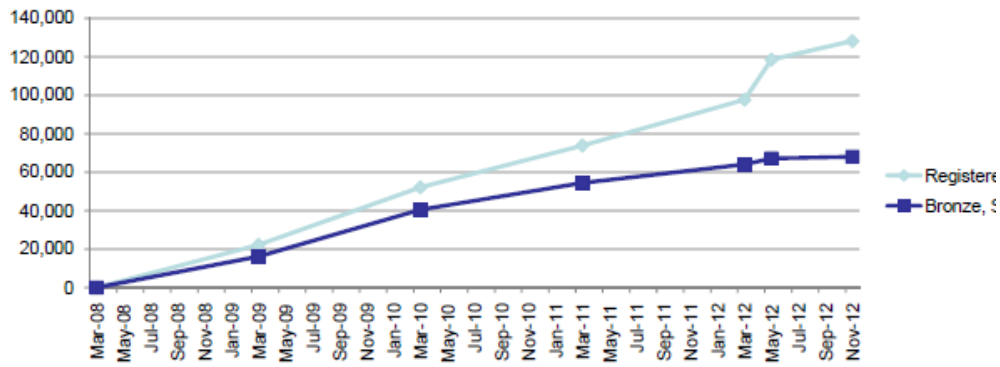
The principle for the standard progression are shown in following Figure 1. The bronze level is reached after an independent audit check of the lawfulness of the operations. The silver award is given to the operator if they are actively improving their performance. The gold award is given to the operator that is providing evidence of improvements.

Figure 26: FORS progression from bronze to gold membership standard



The uptake of the FORS certification system has been regularly progressing since inception in early 2008 and reached a level of about 20% at the end of 2012 (Figure 2).

Figure 27: Progress in number of FORS registered vehicles



3.2) Technical main characteristics

Besides receiving recognition after successful audits, FORS members have access to courses on how to improve their performance, safety and fuel use.

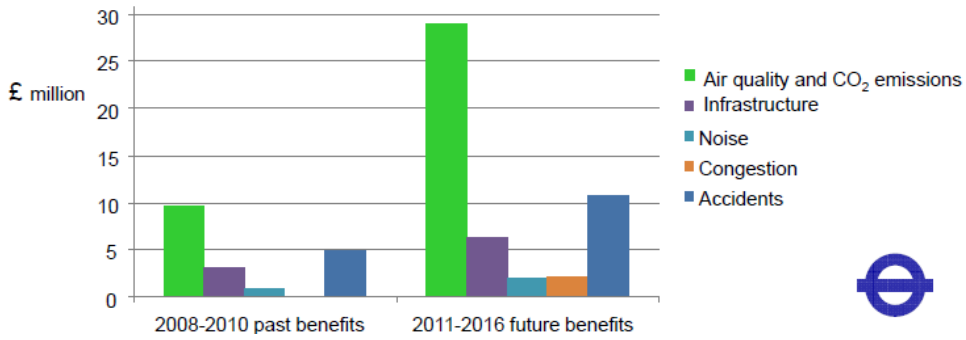
The FORS scheme is managed by Transport for London in the frame of the London Freight Plan.

The audits are performed by accredited FORS auditors.

The bronze, silver and gold certification of operators are given after successful audits.

The FORS workshops are offered by TfL and by consultants.

The FORS IT system is registering the fuel and safety data of the participating businesses.

3.3) Success factors	The public authority label is a much higher recognition than other types of awards. It gives operators a very good image and enable the access to certain types of markets.
3.4) Main benefits	6% improvement on fuel efficiency were measured on average for freight operators. Measured is the difference in average annual fuel use performance between the year before the joining of the FORS scheme and the first year after joining the bronze level. In the following year, further improvements were recorded but it is assumed that there is a continuous annual 6% fuel saving, CO2 reduction and fuel cost reduction compared to the situation before. FORS member show a reduction of 13% in the number of accidents. Distance reduction cannot be recorded so the impact of FORS on lowering external costs of freight transport are limited to fuel use emissions and safety.
3.5) Cost indication	For a participating business, the costs of membership to FORS are not substantial. The fuel use reduction effects of FORS are economically very substantial from the public authority perspective. The benefits were calculated based on the current number of FORS registered operators and the 6% reduction in fuel use and 13% accident reduction. This reduction is assumed to continue year on year for the next period and the external cost calculation is based on a public pricing of about 34 Euro per tonne of CO_2 saved. The result is a total benefit of above 50 mio Euro as reduction of external costs of freight transport for London (Figure 3). **Figure 28: Social benefits of FORS from a public sector perspective: Reduction in external costs of freight transport in London in the period 2008-2016** 
3.6) Barriers / Limitations	The main difficulty is the cost of the set-up of such a public sector driven solution. Another difficulty of the local authority is to engage with and influence the behaviour of a very large number of small freight operators.
3.7) Common practice before implementation	No standard were set by local authorities on how freight has to perform on local streets, and no guidance were provided to the operators on how to improve their business operations and performances.
3.8) Motivation/problem	The engagement with the local transport operator businesses was not given and no incentives were in place for improvements.

3.9) Justification of practice	This recognition scheme is innovative, transferable, has a high impact on fuel use and safety and is already broadly implemented in London.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Operators in many cities and countries could benefit from using FORS as recognition system for their business. Only the operators making deliveries to London could benefit from public tenders.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☐ Yes ☒ No
	FORS targets road freight only.
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
	FORS is a part of the London Freight Plan.
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
	Other UK cities and companies that are located elsewhere in UK and Europe are FORS members and can benefit from the scheme if they are making deliveries to London.
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. Ecostars and many other recognition schemes have produced a rather opaque situation on the market about the criteria to be followed in order to receive the recognition, thus making it difficult for an operator to decide which scheme would be best to be joining in. FORS is a local administration scheme of Transport for London and has a high local visibility.
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.

	Confidentiality of the end-user datasets
5.2) References	www.fors-online.org.uk
5.3) Contact for further details	Stephen Steele, Transport for London stephensteele@tfl.gov.uk
5.4) Date of review	25 Nov 2013
5.5) Pictures	**Figure 29: FORS logo**
5.6) Involvement of SME	Many SMEs are FORS members. The consultancy given to the operators at FORS workshops are provided by SMEs.
5.7) Impact on SME	SME that are freight operators in London receive guidance and recognition for their performance improvements. FORS membership leads to regular improvement in fuel use performance of participating SMEs. SMEs that are involved in auditing and FORS workshop consultancy services are benefiting directly and economically from the scheme.

3.1.16 Lean and Green Municipalities (Connekt)

1) Basic information	
1.1) Identification CL1_107	Lean and Green Municipalities (Connekt)
1.2) Cluster	Cluster 1 (urban freight)
1.3) Responsible authors	Mobycon (NL)

2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ■ Public & private approach
2.2) Actor classification	Delivery services and logistics. Retailers, transport companies, city authorities.
2.3) Geographical Area	Started in The Netherlands. Expanded to Germany, Belgium and Italy. In the Netherlands the following cities have a Lean and Green Award: Drechtsteden (Dordrecht, Zwijndrecht, Papendrecht, Sliedrecht, Alblasserdam and Hendrik-Ido-Ambacht), Amsterdam, Arnhem, Breda, Delft, Helmond, Hoorn, Maastricht, Nijmegen, Roosendaal, Rotterdam, Schiedam, Tilburg, Utrecht, Venlo and Regio Stedendriehoek (Apeldoorn, Brummen, Deventer, Epe, Lochem, Voorst en Zutphen). In Belgium the cities of the Region Wallonia.
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	All sorts of cases have either succeeded in reducing costs and CO_2-emission, are still in progress or are yet to be implemented.
2.5) Date of implementation	This program was introduced in 2008.
2.6) Link to other clusters	• Existing connections: no • *Can there be future links to other cluster topics?* Possible connection to Green Logistics and Co-modality (e.g. connected to last mile delivery) and e-Freight (if ICT is applied to make urban freight transport more efficient).
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
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	Transport, unloading, warehousing and transhipment, last mile delivery.

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: reduce congestion in urban areas	
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	The main problems of urban goods distribution that will be addressed by this program are air pollution by CO_2 emissions, affected liveability by traffic and inefficient logistics because of restrictions and singly business operations. Lean and Green attempts to encourage parties to work together. It also seeks to persuade the government to grant privileges to companies that are 'aware'. Examples that come to mind are convenient loading and unloading locations, priority at traffic lights, or changes to the periods when loading and unloading are allowed. In other words, if businesses work together, then the government will give them greater freedom in terms of city access. As an extra stimulus for municipalities, they can get support of the 'Urban Distribution Coach Team' of Connekt in order to obtain the Lean and Green Award for Municipalities. This Award is a recognition	

	from the Urban Distribution for the efforts to come to a coherent plan for Sustainable Urban Distribution. The ambition is to reduce emission and other negative impacts through concrete measures within a time frame of 5 years.
3.2) Technical main characteristics	Lean and Green for Municipalities is not so much a technical solution as well as a process. This might include some technical measures (e.g. priority at traffic lights, access control), but this is not necessarily the case.
3.3) Success factors	Cooperation and agreements, sharing knowledge and knowhow, monitor and reward results.

3.4) Main benefits	• Financial:
	  ○ Optimized logistical processes, leading to reduced fuel costs and kilometres, reduced time loss
	• Benefits in the field of services:
	  ○ No
	• Benefits for society:
	  ○ Less congestion/improved traffic flow,
	  ○ More liveable city centre,
	  ○ Reduced CO_2 and other pollutants emission
	Examples:
	• 020distribution in Amsterdam: 15% reduction of CO2
	• Venlo regional warehouse: 20-30% reduction of CO2
	• Rotterdam: delivery with truck on natural gas engine and outside daytime period reduces labour costs, fuel consumption and emissions with 16%.

3.5) Cost indication	The costs for municipalities to participate in Lean and Green Municipalities amounts €1.800,- per year. Up until 2014 Connekt will assist in writing Action Plans if needed. Municipalities' plans focuses besides CO2-emission reduction on accessibility, road safety and economical vitality. Therefore, plans are most often written in agreement with partners (TNL, EVO and SME/Chamber of Commerce), which makes writing plans time consuming. In most cases measurements are not only in hands of municipalities, but also in hands of other parties.
3.6) Barriers / Limitations	The Lean and Green programme recommends municipalities to integrate their Lean and Green plan in their current policies. Doing so will optimize investments for measures. Because of cuts in budget and staff, employee's pressure increases, which sometimes results in a situation where there is no time available to invest in the Lean and Green programme at municipal level. At the moment this is the most common limitation for municipalities. Which is a shame, because Lean and Green aims to improve efficiency by combining different policy domains.
3.7) Common practice before implementation	Many separate and single distribution flows by individual companies, not co-ordinated, thus leading to high numbers of trucks and delivery vans in urban areas. In addition many cities created restrictions in order to fight the negative impacts. However, many of these measures worked out to be counterproductive.

3.8) Motivation/problem	Cities/municipalities want to increase the liveability of their urban centres (reduction of noise, CO2-emission, congestion) and companies are interested to reduce their costs of urban distribution without reducing their quality of service.
3.9) Justification of practice	A best practice is characterized by the following attributes: • Best practice includes an innovative approach beyond the common practice • Best practice addresses both business and policy objectives • Best practice have considerable and measurable positive effects on strategic targets • Best practice should be transferable to other companies, initiatives or contexts The approach of the Lean & Green Award for municipalities fulfils all of the above criteria.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ■ Yes ☐ No
	The Lean and Green programme has to have a certain level of prestige and value in other countries. No need for it when there are likewise programs already.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	Collective approach and awards can be a solution in many more industries.
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 success of the collaboration is dependent on the preparedness to make consensus by authorities.
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
	If there is enough support by different critical parties, it is possible to implement. There will be most support in densely populated areas. However, the bigger the area, the higher the number of involved parties and the more difficult to come to a common approach.
4.5) Similar cases	As far as we know there are no similar cases abroad, although the concept is now 'exported' to among others Germany, Belgium and

	Italy.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	This case might be considered for in-depth review, as an approach for sustainable urban distribution, which focuses on an active approach of municipalities to make public and private sector work together.
5.2) References	http://lean-green.nl/en-GB/ http://www.logisticsinwallonia.be/news/pour-la-premiere-fois-en-wallonie-9-entreprises-entament-ensemble-le-programme-lean-green-pour
5.3) Contact for further details	Tel. +31 15 251 65 65 Fax +31 15 251 65 99 E-mail Leanandgreen@connekt.nl
5.4) Date of review	07/10/2013
5.5) Pictures	**Figure 30: Lean and Green for municipalities** 
5.6) Involvement of SME	SME's are not particular focus of the Lean and Green Award, but many shopkeepers in inner cities are SME's and thus involved.
5.7) Impact on SME	Sustainable Urban Distribution makes the inner city more attractive for potential customers of the shops, and thus for the SME's. A liveable city thus creates more turnover, and in addition urban distribution could lead to lower transport and storage costs for the shop keepers.

3.1.17 Urban distribution of small parcels using self-service terminals

1) Basic information	
1.1) Identification CL1_097	Urban distribution of small parcels using self-service terminals: LP EXPRESS 24
1.2) Cluster	Cluster 1, Urban distribution
1.3) Responsible authors	Andrius Jaržemskis, Vilnius Gediminas technical university Some information for the case was supplied by Product manager Andrejus Dolgovas from LP EXPRESS

2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	State owned company, small parcel delivery service, business customers, customers
2.3) Geographical Area	Original solution purchased from Austria (multiple cities), adopted and evolved in Lithuania (multiple cities)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☒ Evolving Best Practice ☐ Best Practice
	Original solution was heavily modified to implement additional services and features
2.5) Date of implementation	2012
2.6) Link to other clusters	This case is also related to Cluster 3 eFreight, as innovative solutions is offered by using IT system.
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
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	Transport, terminal
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) 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:
3) Best practice	
3.1) Description of the practice	Purpose of the solution was to increase accessibility of small parcel delivery service to the users and improve small parcel delivery service. The solution consists of a series of decentral locker banks for final parcel delivery to private and corporate clients, located in different cities in Lithuania, and connected to the national postal service of the country. **Figure 31: LPExpress24 terminal in operation**  Source: http://www.post.lt/files/images/Kaunas,%20Barsausko.JPG Lockers are completely self-service, with options both to drop-off and pick-up parcels. To drop-off parcels, clients may use LP EXPRESS

website to fill in information on receiver and delivery options. Once the web form is completed, client is issued with a code, which is used at the terminal to print a sticky label for the parcel. Labelled parcel is left in a box of senders choice: boxes come in small (610 mm x 80 mm x 350 mm, up to 30 kg), medium (610 mm x 175 mm x 350 mm, up to 30 kg), large (610 mm x 365 mm x 350 mm, up to 30 kg) and extra-large (610 mm x 745 mm x 350 mm, up to 30 kg) sizes. Number of boxes per terminal depends on combination of boxes used. Combination of boxes within terminal depends on demand in the specific location; typical terminal contains boxes of all sizes, e.g. 2 extra-large boxes, 10 large, 32 medium boxes and 24 small boxes.

Once the parcel is labelled, box of chosen size automatically opens, parcel is stored within and the box locks itself again. Parcels are picked up daily, usually late in the evening, delivered to be sorted to the sorting centre, sorted and distributed by van type delivery vehicles, e.g. in the picture below. The parcels do not require any special modification of vehicles.

The client receives information (email or SMS) that the parcel has arrived and the pick-up can occur any time 24h per day and 7 days a week, with a code, and thus the client obtains access to the LP Express 24 box where his parcel was delivered.

The terminals are located in frequently visited spots of the city, in the most case, next to large supermarkets. Depending on size of a city or town, there might be several terminals, however town with population lesser than 50 000 are likely to have one or two terminals. Trial and error method was used when setting up network of terminals, now the location of terminals and combination of its boxes is changed based on client requests and demand. Depending on size of a town or city, the terminal is likely to be accessed by no more than 20 minute drive.

This solution of self-service terminals aims at facilitating the parcel deliveries and reducing the number of trips per client, avoiding multiple delivery trials in case the client is not at home.

Figure 32: Delivery to terminal

	Though it was no a specific goal of LP Express 24 to increase sustainability, the results of the implementation has led to an increased sustainability performance. This was achieved due to optimized logistic chain, as shipments are consolidated and smaller vehicles are used.
3.2) Technical main characteristics	41 city and towns are in the delivery network, which is still expanding. Self-service terminals are designed with an optimized combination of storage boxes for small, medium and larger parcels based on customer behaviour in the specific area.
3.3) Success factors	• The solution was purchased from a company which already tested it. • The main success factor is that the original solution was significantly expanded, tailored to the needs of the local market and • The solution is constantly improved in design and logistics service quality • Pick-up and delivery system is optimized to ensure parcel delivery within 24 hours – one of the quickest parcel delivery options in the country.
3.4) Main benefits	• Extended service variety and tailored solution for the market ensured successful solution adoption / reduces risk of unsuccessful adoption • Unique additional features of the solution create additional value and opportunities for further spread of the self-service terminal solution • Integration of self-service terminals with other delivery services creates competitive advantage • Better utilisation of infrastructure and improved staff efficiency • Possible quantitative measures: number of services provided; number of possible combinations of services.
3.5) Cost indication	- Not available at this stage
3.6) Barriers / Limitations	Service was completely new to the market; customers are usually sceptical before trying it for the first time. Service is still heavily marketed to the customers. Main barriers were issues with the legal system: there are no legal acts that would define customer rights and service provider responsibilities regarding parcel sent via self-service. There are no acts to define whether digital codes substitute signatures in case of registered parcels. Changes in the legal base are still being implemented, until then LP EXPRESS takes most responsibility for the parcels.
3.7) Common practice before implementation	Parcels were picked-up and sent via couriers or post office. Couriers are relatively expensive for this type of parcels, and post offices have queues as well as limited working hours. Dropping-off parcel at the post office took long time both due to possible queues at the peak hours and to the procedure itself (packing, labelling, etc.).
3.8) Motivation/problem	Customer dissatisfaction regarding procedures associated with parcel pick-up and delivery, too long delivery times, competing services from

	other delivery companies.
3.9) Justification of practice	This case displays example of successful innovative solution adoption and best practice development, which is transferable to other markets as well.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	Larger countries may not be able to provide 24 hour delivery. Same legal barriers as in Lithuania's case (undefined rights and responsibilities) may apply.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Business customers (mostly online shops) are already using terminals to deliver goods. System would work even within large companies/factories or any other industries where constant flow of small items exists.
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 does not require special political framework or other conditions to be implemented.
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 is already used for international delivery.
4.5) Similar cases	Similar practice exists in multiple countries (e.g. Denmark, Germany), however Lithuanian case is unique due to additional service the terminals are able to provide (mainly parcel drop-off and parcel delivery management over the internet interface).
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
5.2) References	www.lpexpress.lt

5.3) Contact for further details	Andrejus Dolgovas andrejus.dolgovas@lpexpress.lt
5.4) Date of review	18/11/2013
5.5) Pictures	 **Figure 33: LPexpress24 solution for parcels deliveries in Lithuania**  Material is available from www.lpexpress.lt
5.6) Involvement of SME	SME's involved in the case are mostly customers in B2B scheme.
5.7) Impact on SME	SME's may use self-service terminals to deliver their goods to the end customers both increasing their own service attractiveness and geographical coverage of their service.

3.1.18 POST Receiving box

1) Basic information	
1.1) Identification CL1_103	**POST Receiving box ("POST Empfangsbox")**
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	Mag. Jürgen Schrampf, ECONSULT Betriebsberatungs G.m.b.H. Jochen Rindt-Str. 33, A-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 Mag. Christian Haid, Österreichische Post AG (see contact below)

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? - Parcel Service Department of Post AG - Property owners All industries and branches are relevant, which have physical goods and send these goods via parcel services to private customers (B2C).
2.3) Geographical Area	Austria
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	There have been man attempts and pilot-systems to use boxes for a last mile solution in parcel distribution and most of them failed to become operative practice. This system by the Austrian Post has been implemented is broad scale and runs in daily operation with already several hundred units and in different cities.
2.5) Date of implementation	Started in 2012 - actually in the expansion and roll-out phase
2.6) Link to other clusters	Cluster 2 – Green 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
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 …

<table>
<tr><td>2.9) Supply chain elements</td><td colspan="2">The system addresses the area of delivery, last mile solution by road (delivery van, motorcycle, scooter, etc.) and the topic of deposit solutions for parcel services.

Main actors involved are
• Parcel Service Department of POST AG
• Property Owners and Managers

The system brings more efficiency in operation concerning handling during the delivery process and handling in the depot. The main goal is to reduce return shipments</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) 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 colspan="3">3) Best practice</td></tr>
<tr><td>3.1) Description of the practice</td><td colspan="2">The “receiving box” allows the deposit of registered mail at the customers’ residence. If a shipment cannot be delivered the postman deposits it in the receiving box and notifies the recipient. The recipient removes the notification card from the standard mailbox, and uses it to open the receiving box.</td></tr>
</table>

	The boxes can be installed in the entrance areas of houses and are available for all residents. If a resident receives a registered box or letter and is not at home, the postman will drop the mailing in the receiving box, and he will leave an RFID-card in the letter box beside. With this card the customer can open the box and receive his delivery.
3.2) Technical main characteristics	It is a solution that can be deployed stand-alone and it works based on RFID (Radio Frequency Identification).
3.3) Success factors	It is a solution that is easy to use and handle for the carrier as well as for the customer. In addition this solution can be placed at any time at any location without the necessity of advance preparation or infrastructural needs (e.gl. electricity, Internet access).
3.4) Main benefits	• Financial benefits → There is no need for a notification any more. • Economic benefits → There is only one delivery attempt. • Benefits in the field of services → The customer has the shipment at his address even if he/she is not at home. • Benefits for the society→ The customer does not need to go or drive to the post office to collect the shipment, also the carrier does not need to drive twice or even more often to the same address. • Environmental benefits, expressed in CO_2 or CO_2equivalent → As there is only one successful delivery attempt any more, the system helps to save vehicle kilometres and CO_2-emission.
3.5) Cost indication	The price for the purchase of a receiver box vary due to type and size. There are three different sizes available for indoor and outdoor solutions. M - Medium: 395 x 220 x 280 L – Large: 395 x 660 x 280 XL - Extra Large: 800 x 660 x 350 The prices are per box and the owners, generally the real estate owners, are charged. **Table 3: Prices of the receiver box for parcels deliveries** TYP / GRÖSSE / PREIS EUR / AKTION Innen / M / 189,– / **169,–** Innen / L / 209,– / **189,–** Innen / XL / 289,– / **269,–** Außen / M / 219,– / **199,–** Außen / L / 239,– / **219,–** Außen / XL / 319,– / **299,–** *Source: Post AG*
3.6) Barriers / Limitations	The main topic regarding barriers was the access to the property managers. There is still work done on that, but step by step the success is rising in addressing this main user group.

3.7) Common practice before implementation	The customer found a notification in his/her letter box and had to pick up the shipment at a special time at the defined post office.
3.8) Motivation/problem	The main drivers where to raise convenience for the customers, decrease costs in operation by avoiding delivery attempts and to implement sustainable logistics solutions, especially in sensitive urban areas.
3.9) Justification of practice	There have been many different attempts using boxes for last mile delivery and drop-off systems. Most of these systems failed or were stuck in a pilot phase without a business case for a roll-out. The Post receiving box has been successful and in the roll-out-phase - available and implemented in all major urban areas in Austria: • Vienna • St. Pölten • Graz • Linz • Salzburg • Klagenfurt • Villach • Innsbruck • Bregenz • Dornbirn • Feldkirch • and bordering rural areas to these cities.
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
	Political and legal frameworks have to be evaluated due to national laws. In Austria there was no problem regarding the realisation of this service.
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	In Austria there is no similar case so far, concerning Europe it is not evaluated if there are other parcel service providers or postal companies which are implementing similar infrastructure systems by using boxes with RFID-technology.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	There is not sufficient information and data available or published yet.
5.2) References	The information was provided by the Post AG.
5.3) Contact for further details	Mag. Christian Haid, Österreichische Post AG Projektmanagement und Divisionsentwicklung Haidingergasse 1 1030 Wien Tel.:+ 43 (0) 577 67 80005 Fax:+ 43 (0) 577 67 28080 Mobil: 0043 (0)664 624 1032 E-Mail: christian.haid@post.at
5.4) Date of review	Latest date of update of this format 22 Nov 2013
5.5) Pictures	**Figure 34: Design of receiving boxes of the Austrian Post** 

	RECEIVING BOX - HOW IT WORKS  1 Parcel is put into the receiving box and the notification is programmed 2 The postman puts the programmed notification into the mail box 3 The customer takes the programmed notification out of the mail box 4 The customer opens the receiving box with the notification and takes out his/her parcel/registered mail   *Source: Post AG / www.post.at*
5.6) Involvement of SME	No SME are involved.
5.7) Impact on SME	As customers, SMEs can benefit from the service.

3.2 In-depth reviews

3.2.1 Binnenstadservice (NL)

1) Basic information	
1.1) Identification CL1_108	Binnenstadservice Nederland
1.2) Cluster	Urban freight
1.3) Responsible authors	- Mobycon - Eco2city (info@eco2city.nl)
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	- freight transporters (carriers) - shippers - retailers - shopkeepers - local authorities
2.3) Geographical Area	Nijmegen, Netherlands
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	Binnenstadservice Nederland (BSN) started in Nijmegen. At this time, after 5 years, about 14 other cities are working with the Binnenstadservice concept.
2.5) Date of implementation	April 16, 2008
2.6) Link to other clusters	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
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 …

<table>
<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).
- cross docking, delivering goods
- storage
- handling
- unloading / loading
- warehousing
- transhipment
- unpacking
- E-Fulfilment</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, i.e. more attractive inner city</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, increased service level</td></tr>
<tr><td colspan="2">For both actor groups:
☐ Limited climate change
☒ Reduced emissions
☐ Conservation of resources
☒ Others? Please specify: reduced congestion</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): more attractive inner city</td></tr>
</table>

2.12) Social benefits	Where does society 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
3) Best practice	
3.1) Description of the practice	Binnenstadservice Nederland is an innovative concept already applied now for five 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 of two logistics service providers per city. One of them can be the local bike courier. Through the efficient logistic solution the city centre gets cleaner and more liveable. 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 centre it improves the environment for habitants and customers.
3.2) Technical main characteristics	- Availability of a warehouse (urban distribution centre) - Availability of clean distribution vehicles (by local partners) - ICT system for handling orders, labelling, etc.
3.3) Success factors	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	The main benefits of Binnenstadservice are: Financial benefits: - Shop keeper: reduced stock at expensive shop floor, reduced time needed to receive/ship goods, predictable process - 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 emballage, empties, paper Benefits for society: - Less congestion, more liveable city centre. - reduced maintenance costs. Environmental benefits: - Reduced CO_2 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 CO_2 emission (assuming 100% participation of all small shipments). See also 6.2.
3.5) Cost indication	The business model is based on the fact that both shopkeepers (end receivers) and shippers/carriers have a contract with Binnenstadservice. End receivers 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	Binnenstadservice needs a lot of retailers to join to create the critical mass to make it successful. In many cities Binnenstadservice started 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	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	Environmental concern (air quality and noise) and nuisance of trucks and delivery vans in the city centre. In general freight deliveries are conflicting with liveable cities.

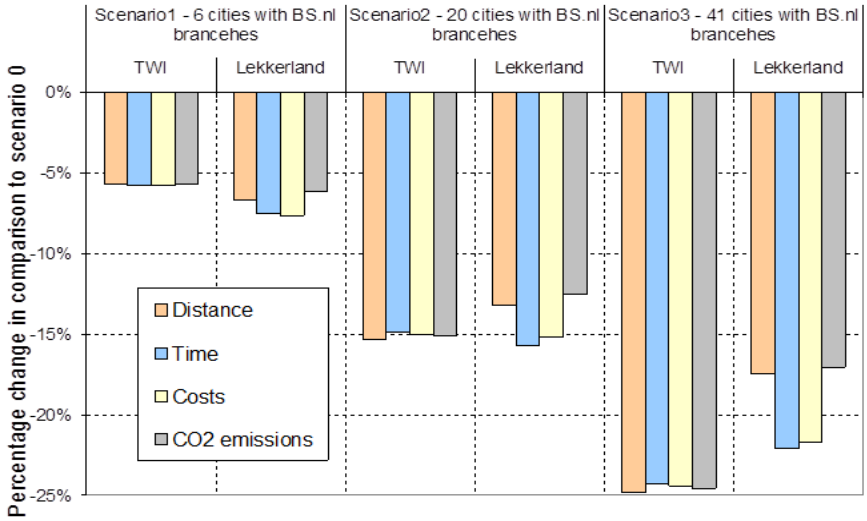
3.9) Justification of practice	After four years of the launch of Binnenstadservice in Nijmegen it has rolled out in 13 other cities in the Netherlands. And it can be transferred to other cities across Europe. Solutions continued to be operational after a small period of public funding.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	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
	The Binnenstadservice approach is now being transferred to the E-logistic market, to other actors and end receivers in the cities and to other areas beside the inner city.
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
	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	CityDepot in Belgium, Citylogistik in Denmark
5) Additional information	
5.1) Consid-	Should this case be further considered for in-depth review? ☒ Yes ☐ No

eration for in-depth analysis	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 other projects, 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: 25 Nov. 2013
5.5) Pictures	 **Figure 35: Binnenstadservice logo and vehicle**  **Figure 36: Clean vehicles in operation**
5.6) Involvement of SME	Are SME involved in the case? Describe their role or their potential role. The customers in the cities, i.e. the receivers of the goods, are all retailers (shops, restaurants, café's, etc.) and they are all SME's.

5.7) Impact on SME	What is the impact of the case on SME (how can they benefit, what could be the impact on their growth)? Please describe. A more co-ordinated approach of the deliveries and sending of their goods (fewer deliveries at suitable times) will make their life easier. Furthermore they will need less storage space in their shops. And their shopping street becomes more attractive, thus potentially leading to more turnover.
6) In-depth information	
6.1) Costs	• *What are the (estimated) costs (e.g. investments, operation)* Binnenstadservice Netherlands is a franchise organisation. Every franchisee in a city is an independent local entrepreneur. Ideally the local entrepreneur locates the Binnenstadservice depot 'under the same roof' with some other warehouse (not competing with the Binnenstadservice function), for example it could be the local wood trade company or the local removal firm. Those are 'safe' functions because they're not competing amongst carriers. So every carrier feels safe to make use of the warehouse. In this way the Binnenstadservice entrepreneur can start up without huge investments and he can operate low cost because of the combined functions at the warehouse/cross dock location. The estimated costs in a start up phase as described above would be around 10.000 euros a month, these are all operational, variable, costs. Off course the costs will grow as the number of contracts, and thus amount of work that needs to be done, grows. And the turnover grows. The Binnenstadservice entrepreneur works towards a positive financial result. • *What financing is presently applied/planned (partnership, private, public funding)* All new Binnenstadservice entrepreneurs are now starting up with private funding, usually their own money.

6.2) Benefits / Strengths	One way to describe the benefits is by showing the results of two case studies TNO published in 2010. TNO did research on the effect of cooperating with Binnenstadservice with two companies (TWI and Lekkerland). These two companies have a contract with Binnenstadservice Netherlands to use the local Binnenstadservice branches to serve their end customers (shops) in these cities.
	The results of this research are presented below:
	Binnenstadservice (BSS) key impacts
	• BSS in more cities: interesting for carriers and shippers
	  • No problems with local regulations
	  • One cont(r)act (BS Netherlands) for many cities
	  • Large time-windows
	  • Enough space for (un)loading
	• Effects calculated for 2 different shippers/carriers
	• Scenario's (maximum effect all carriers' deliveries in city to BSS)
	  • Scenario 0 – no BSS
	  • Scenario 1 – 6 cities with BSS
	  • Scenario 2 – 20 cities with BSS
	  • Scenario 3 – 41 cities with BSS

Figure 37: Effects of Binnenstadservice: 4 scenario



6.3) Challenges

- *What are the main challenges of the project, concept, strategy, initiative?*

Binnenstadservice needs to have a critical mass of shopkeepers to make it environmental successful. For financial success the shippers and transport companies need to contract Binnenstadservice and deliver the goods to the Binnenstadservice depot. Binnenstadservice delivers to the inner city shopkeepers. These parties are very slow decision makers. The leads to convince them are long and running contract periods with their logistic service provider are 'in the way'. Today, Binnenstadservice combines this B2B service with B2C service in order to be less vulnerable.

- *What are the main risks?*

Lack of critical mass. The system works when there is a critical mass, which means cost savings.

Critical mass not only applies to the number of shopkeepers participating in one city, but also a critical mass of cities where BSN is operational. The more cities participate in the concept, the more attractive it is for shippers and logistics service providers to make use of this concept.

- *Are there undesired secondary or external effects?*

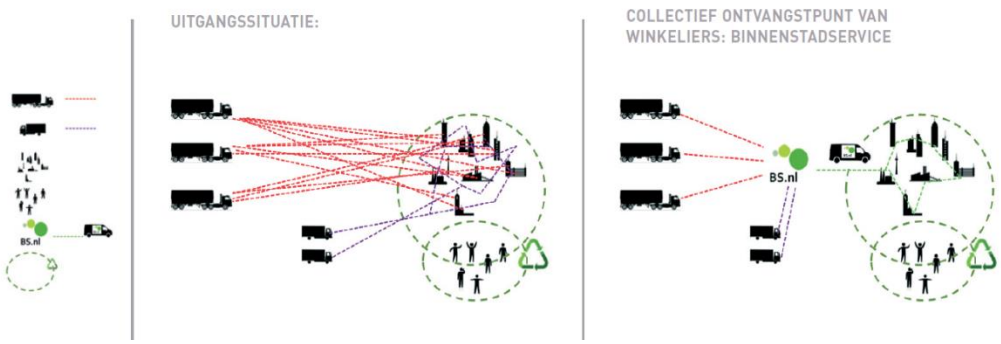
No. Every stakeholder, even 'elsewhere' en 'later on', can en may win by this solution.

6.4) Implementation steps

Since Binnenstadservice is a franchise organisation with a 'history' of 5 years now, every next new Binnenstadservice entrepreneur in a new city will be easier to start up. Because of the 'lessons learned' and because of the coaching from the national organisation. This organisation even coaches in other European cities at this moment.

1. Preparation: 3 to 4 months	2. Implementation: 3 to 4 months	3. Operation: starts after 6 to 8 months

	• First of all there needs to be a local entrepreneur who's driven in both social and financial results. • After this local entrepreneur is found (usually by Binnenstadservice Netherlands), he or she involves (coached by BS NL) other actors: local government, local end receivers (entrepreneurs, consumers). • On a (inter)national scale shippers and logistic service providers are relevant in the process.
6.5) Process	The initial process of preparing, implementation and getting started took almost two years in the first city (Nijmegen). 100 local shopkeepers were needed to start the Binnenstadservice business. It took a lot of talking to convince them about the value of this service compared to the invoice they were willing to pay. Soon Binnenstadservice realised they had to scale up in order to be of value for the shippers and carriers to create a sound business case. So they started to make appointments in other cities en do some feasibility studies there. In those days it took more than a year to get started. Now half a year can be enough for a new city to start up. The transferability depends on the absence of the 'not invented here syndrome'. If there is no such syndrome in a new city, the implementation goes fast. If the new city wants to invent their own solution, it takes some more time. The slowest cases are in the cities where a local government is trying to implement their own solution (by procurement for instance).  **Figure 38: Map of Binnenstadservice operations in the Netherlands** The above map shows the activities of BSN to start up BSN implementation in various cities across the Netherlands

6.6) Technical feasibility	Technically speaking BSN is not a real challenge. One just needs a warehouse (urban distribution centre), and hires a local carrier with a clean distribution vehicle. The ICT system for handling orders, labelling, etc. is already available by the Franchise organisation Binnenstadservice Netherlands.
7) Cluster specific information	
7.1) Before-after comparison of distribution systems	In following the changes in the urban distribution systems before and after trial starts are presented  **Figure 39: left: situation without Binnenstadservice depot and distribution (before); right: situation with Binnenstadservice depot and distribution (after)**

7.2) Before-after comparison of impacts	**Wider effects of Binnenstadservice:**
	Considerable savings per delivery (in case a BSS branch is used) were calculated for different scenario presented in 6.2.
	• Kilometres: 48-72%
	• Time: 60-70%
	• Costs: 59-71%
	• CO_2 emissions: 47-71%
	• Savings vary based on:
	  • Type of deliveries
	  • Limiting factor for length vehicle round-trip
	  • Number of kilometres between city and carriers' DC
	  • Number of deliveries in city
	• Savings (per order) are similar in case only city centre addresses are delivered via BSS (in stead of all city addresses) of carriers

7.3) Before-after trial description	In 2009-2010: The Binnenstadservice solution was tested by the Transumo research team: Erasmus Rotterdam, TNO and Radboud University in the city of Nijmegen and with two national suppliers. This research team did research on the effects for the city of Nijmegen (air pollution, traffic safety, noise), on the effects on local entrepreneurs and their willingness to join this solution and on the sentiments local consumers and national carriers had. The team used models to calculate the effects on kilometres, CO_2, time and costs; both local and national. The zero measurement was the current situa-

	tion, so without a Binnenstadservice. The team carried out a survey both with local entrepreneurs and national carriers. In 2012-2013: Dinalog 'Schone Ketting' and 4C4D research team. The research team carried out a study with 6 national shippers. What would be the effects on the same variables as above (kilometres, CO2, time, costs) in case this shipper/carrier would cooperate with 8 local Binnenstadservice points. The team did a survey amongst local entrepreneurs in 3 cities. The conclusions: **Sales Line shippers and carriers** The first revenue line is the savings realized by suppliers / carriers that will create a single point of delivery for all its customers based in that city. The analysis at 6 companies shows time and mileage saving and increase of the degree of loading in all cases. The effects have been very dependent per company. For example, the effect in the reduction of time per stop ranges from 5 to 25 minutes. The whole effect is a strong indication for the reduction of costs for shippers and thus revenue-opportunities for Binnenstadservice. **Retail Sales Line** The second line is the appreciation by retailers. The conclusion is that the value is largely determined by the conditions in and around the shop and is largely based on unburdening of the entrepreneur. This study found that entrepreneurs who recognize that unburdening helps in their business, choose for Binnenstadservice and are also willing to pay an invoice. The research team has placed both revenue lines next to the cost of a Binnenstadservice establishment and notes that this results in a sound business case.
7.4) Private and public sector target evaluation	The main effects of Binnenstadservice are to reduce the emissions and to improve the effectiveness of the logistics service to city centres. These effects were evaluated as degree of importance in reaching the targets of BESTFACT. The results of this evaluation can be seen in the following Figures.

8) Evaluation of strategic targets, note / 10

Figure 40: Private sector targets evaluation of Binnenstadservice

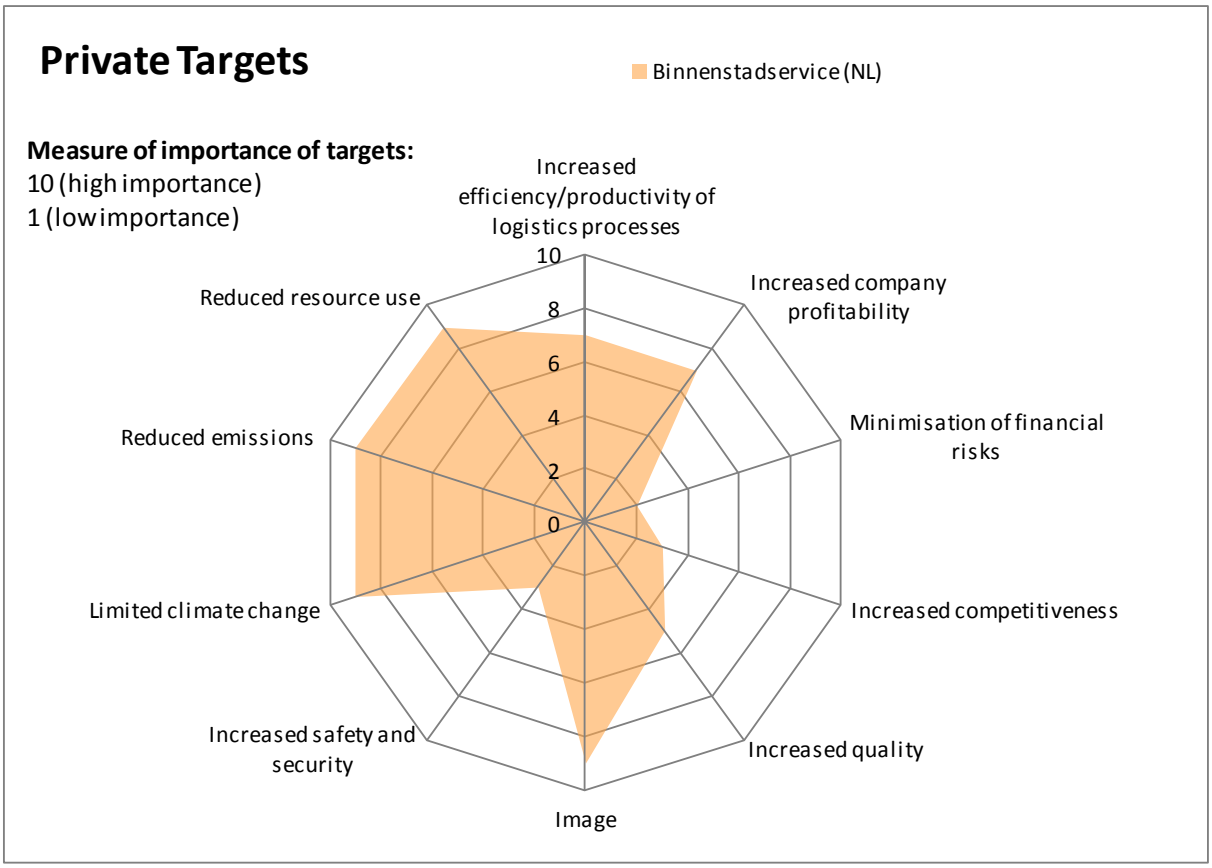
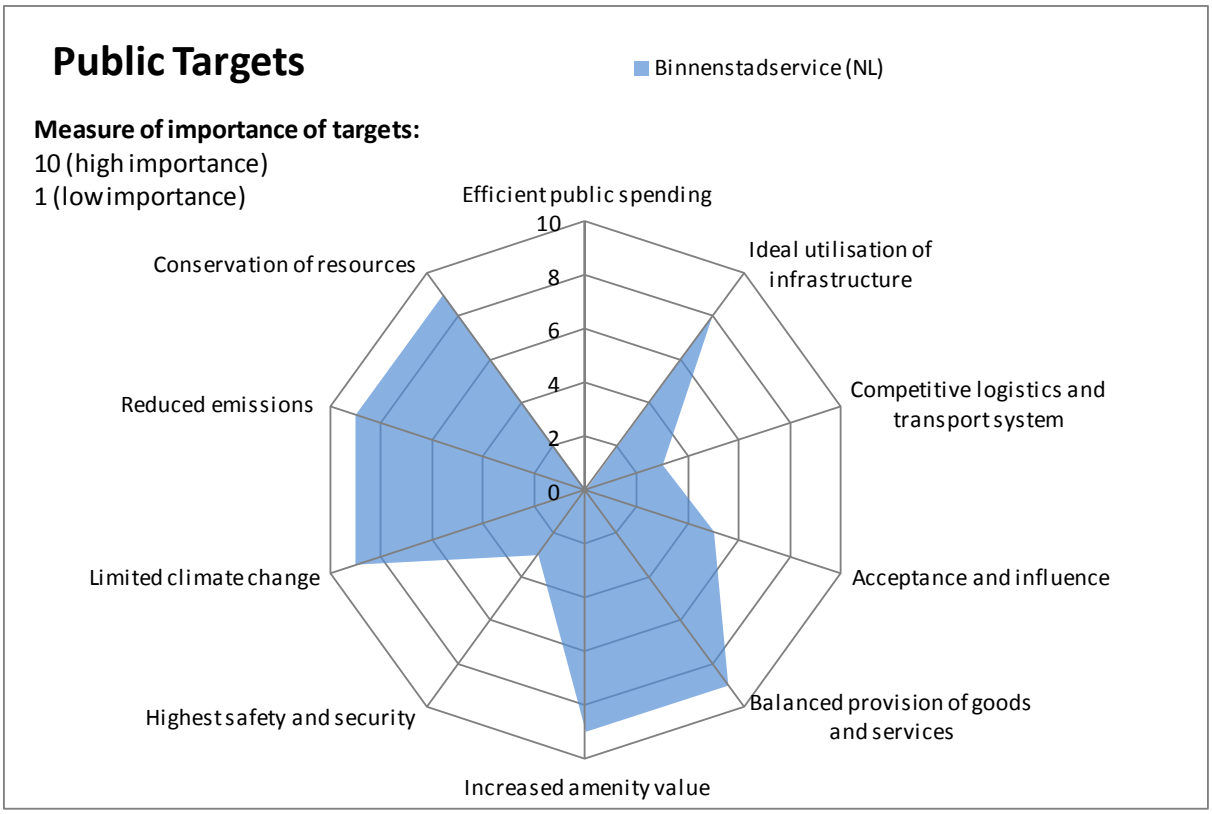


Figure 41: Public sector targets evaluation of Binnenstadservice



3.2.2 Cityporto Padova

1) Basic information	
1.1) Identification CL1_105	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 appr.
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 m^2) 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: Green logistics. Cluster 3: e-freight. 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
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 …
	Cityporto service is provided by 12 CNG-powered vehicles.
2.9) Supply chain elements	The main supply chain elements covered are: • Warehousing (cross-docking) • Last-time transport and delivery

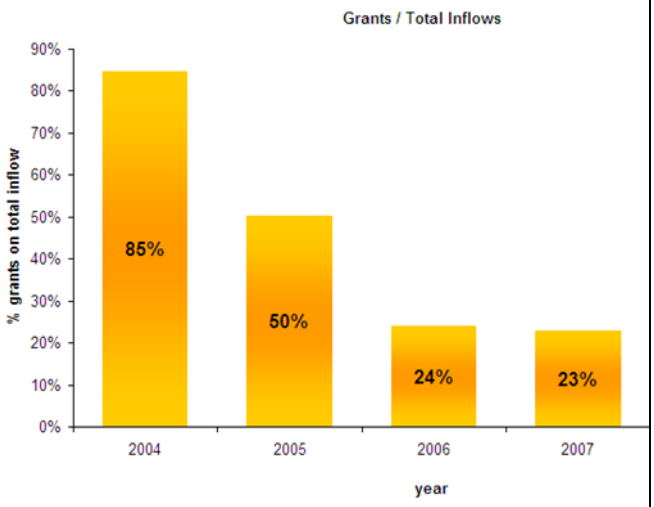
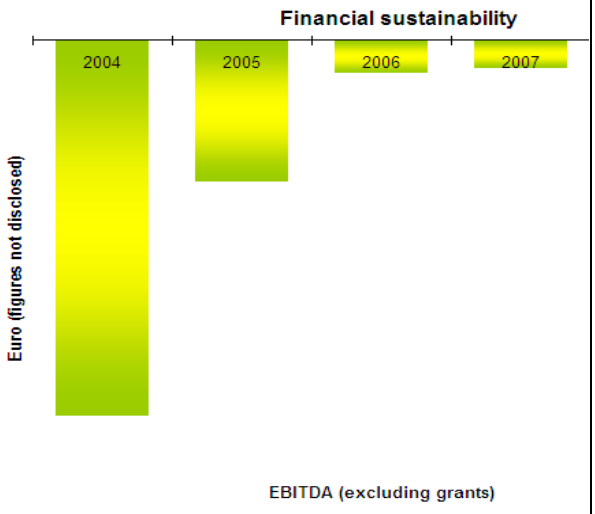
2.10) Which targets can be supported by the implementation?	*For public actors:* ☐ Efficient public spending ☒ Ideal utilisation of infrastructure ☒ Competitive logistics and transport system ☒ Acceptance and influence ☐ Balanced provision of goods and services ☐ Increased amenity value ☐ Highest safety 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 ☒ REDUCED CONGESTION DUE TO THE CONSOLIDATION OF GOODS	
	Please specify all other and different targets here…	
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	"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 830,000 m^2. 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 more than 100.000 deliveries per year (2012), for 60 customers (the major part of couriers and forwarders operating in the city, including express couriers, 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 1549 sq.m. wide cross-docking platform (including a 229 sq.m. wide refrigerated cell) 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. Details on economic, environmental and social benefits are provided below in the in-depth review, section 6.2)
3.5) Cost indication	Cityporto turnover for delivery service is nowadays around 500,000 Euros, and the service is profitable. 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 (see below 6.1) show the intensity of grant on total inflows and the financial sustainability of Cityporto service during the start-up period.
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 perishable goods.
3.7) Common practice before implementation	The common practice for delivering goods in Padova city centre, was to use diesel vehicles, vans and trucks, for direct transport from the manufacturers and logistics depots to the final customers in the delivery area.
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 an in-depth analysis.
5.2) References	The latest presentations and data on Cityporto are available at www.cityporto.it Vaghi C., Pastanella M. (2006) "Valutazione ex post dei benefici sociali e ambientali di una sperimentazione di city logistics", SIET, Trieste, 2006.
5.3) Contact for further details	Mr Paolo Pandolfo - COO of Interporto Padova pandolfo@interportopd.it
5.4) Date of re-	26/11/2013

view	
5.5) Pictures	**Figure 42: CNG van used for last mile deliveries by Cityporto Padova**  **Figure 43: Location of the Cityporto depot in the Padova logistics area** 
5.6) Involvement of SME	Many clients receiving their goods through Cityporto are SMEs and some of the transport operators making deliveries to Cityporto are SMEs as well.
5.7) Impact on SME	The future growth prospects of such a solution are good. SMEs can benefit from such a solution either by becoming a business partner or client, or by replicating the same solution in a different city or country.

6) In-depth information	
6.1) Costs	Cityporto turnover for delivery service is nowadays around 500,000 Euros, and the service is profitable. Grants were provided to Interporto di Padova (a public in-house company itself) for the service start-up in a 4-year timeframe (2004-2007). The City and the Province of Padova, Veneto Region and the Chamber of Commerce of Padova provided a total grant of 360,000 €. The intensity of the grants decreased year by year and granting stopped in 2007. 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 44: Proportion of grants in the revenue of Cityporto during starting phase**  **Figure 45: Earnings before interest, taxes, depreciation, and amortization**  After 2007, Cityporto only benefitted from spot grants achieved for installing the refrigerated cell in the UCC (50% from Italian Ministry of Environment), and the purchase of one test electric vehicle (25% from EU CO2NEUTRALP Project).
6.2) Benefits / Strengths	**Environmental benefits:** Since its early years, Cityporto has been subject of impact assessment activities, in order to scan the environmental benefits generated by the implementation of the service.

	Gruppo CLAS made a survey in 2011, 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 estimated at:
	  ○ CO_2: 220 tonnes
	  ○ NOx: 370 Kg
	  ○ SOx: 70 Kg
	  ○ VOC: 210 Kg
	  ○ PM10: 51 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, 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.
	
	A less recent survey, performed by CERTeT-Bocconi University in 2006 (Vaghi 2006), showed a B/C ratio of 2,01 for the two start years of Cityporto service, in a Cost-Benefit Analysis where costs side was represented by grants received by Interporto di Padova for the start-up.
	
	Transport efficiency: The latest survey of 2011 allowed the analytical calculation of mileage performed by Cityporto vehicles (see above). According to the calculation, the average mileage per delivery was **1.36 km/delivery** from July 2008 to June 2010, compared to an ex-ante situation of 5.95 km/delivery.
	
	The latest Cityporto statistics reports 101,666 deliveries in 2012. The total distance covered by the 11 vehicles in operational is estimated 176,000 km per year, which leads to an average distance of **1.73 km/delivery.** The increase in average mileage is due to the extension of the geographical range of deliveries by Cityporto. In 2012 vans started serving the thermal resorts of Abano and Montegrotto, about 20 km far from Cityporto UCC.
	
	Surface: the UCC is established on a surface of 1,549 sq.meters, including 229 sq. meters occupied by the refrigerated cell.

6.3) Weaknesses	Barriers still exist in attracting to such cooperative and efficient city logistics service more time-sensitive goods such as perishable goods, since this logistic segments need a time-definite delivery which is often not compati-

<table>
<tr><td></td><td colspan="3">ble with the additional cross-docking operation needed in the UCC.

However, the service proved to be attractive to parcel business, since nowadays nearly 40% of last-mile deliveries managed by Cityporto is on behalf of an express courier, namely GLS.</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: See description of process below in 6.5)</td><td>2. Implementation: See 6.5)</td><td>3. Operation:
…

The service is operational since 2004</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?

• Interporto di Padova (local freight village manager)
• City of Padova
• APS Holding (in-house public company)
• Padova Chamber of Commerce</td></tr>
<tr><td>6.5) Process</td><td colspan="3">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).

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.

The next development steps are aimed at improving Cityporto 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 foreseen 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, integra-</td></tr>
</table>

	tion with the new ICT terminal management system, to be installed in 2013.
6.6) Technical feasibility	The practice has proven to be feasible since 2004, with many cases of replication ("Cityporto model") in several Italian medium-sized cities.

7) Cluster specific information

Before-after comparison of distribution systems

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 an usual ex-ante of goods delivery with diesel van and an ex-post practice with consolidated clean vehicles after the implementation of a UCC-based model.

Figure 46: Ex-ante situation of deliveries to Padova ZTL

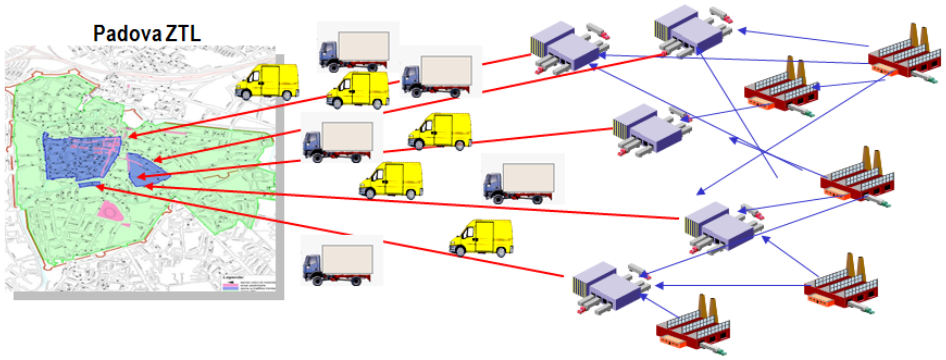
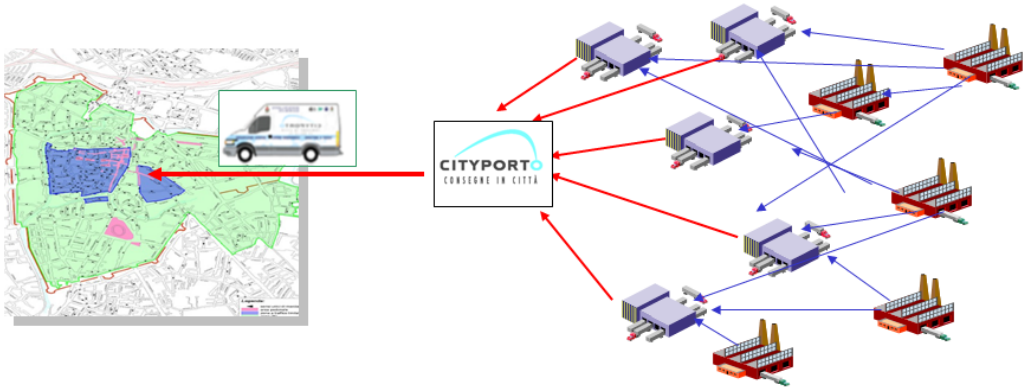


Figure 47: Ex-post situation of Cityporto Padova



8) Evaluation of strategic targets, note / 10

Figure 48: Private sector targets evaluation of Cityporto Padova

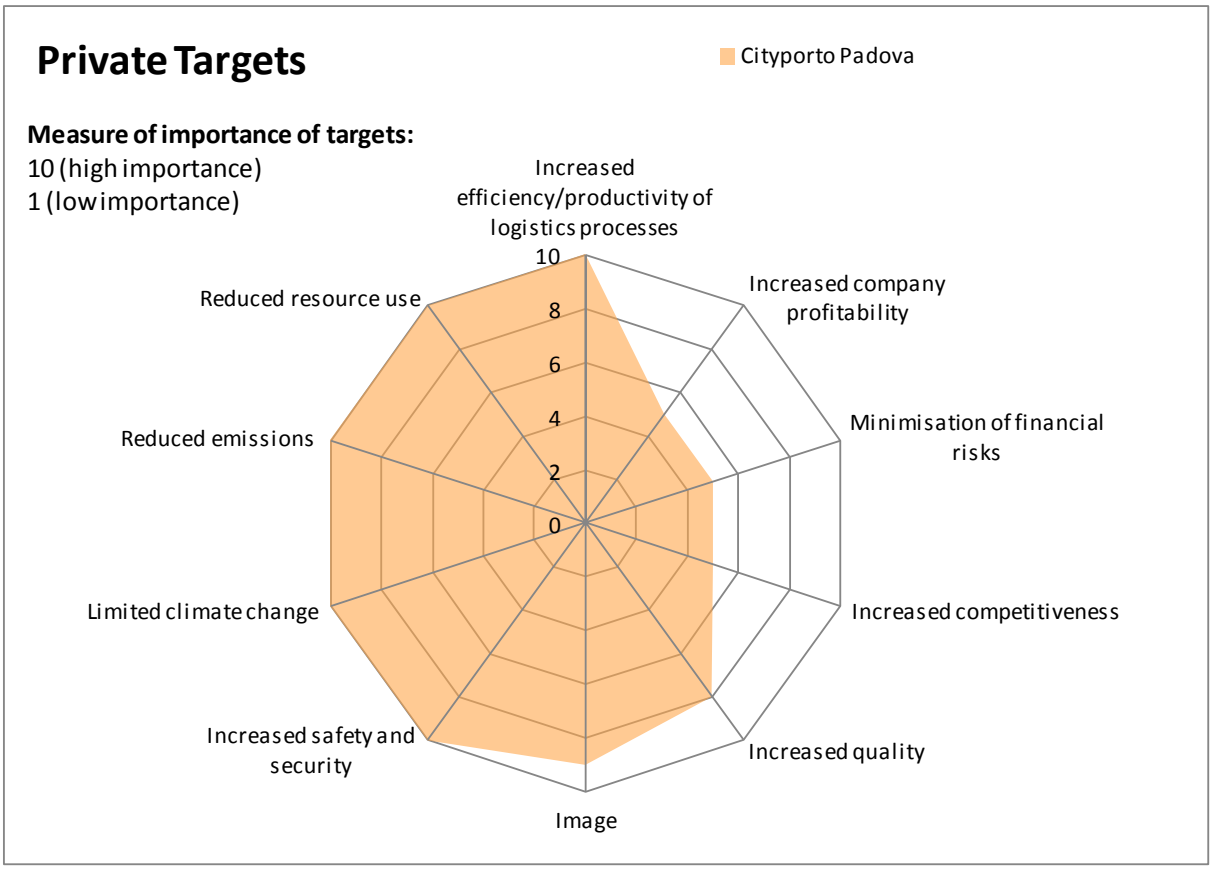
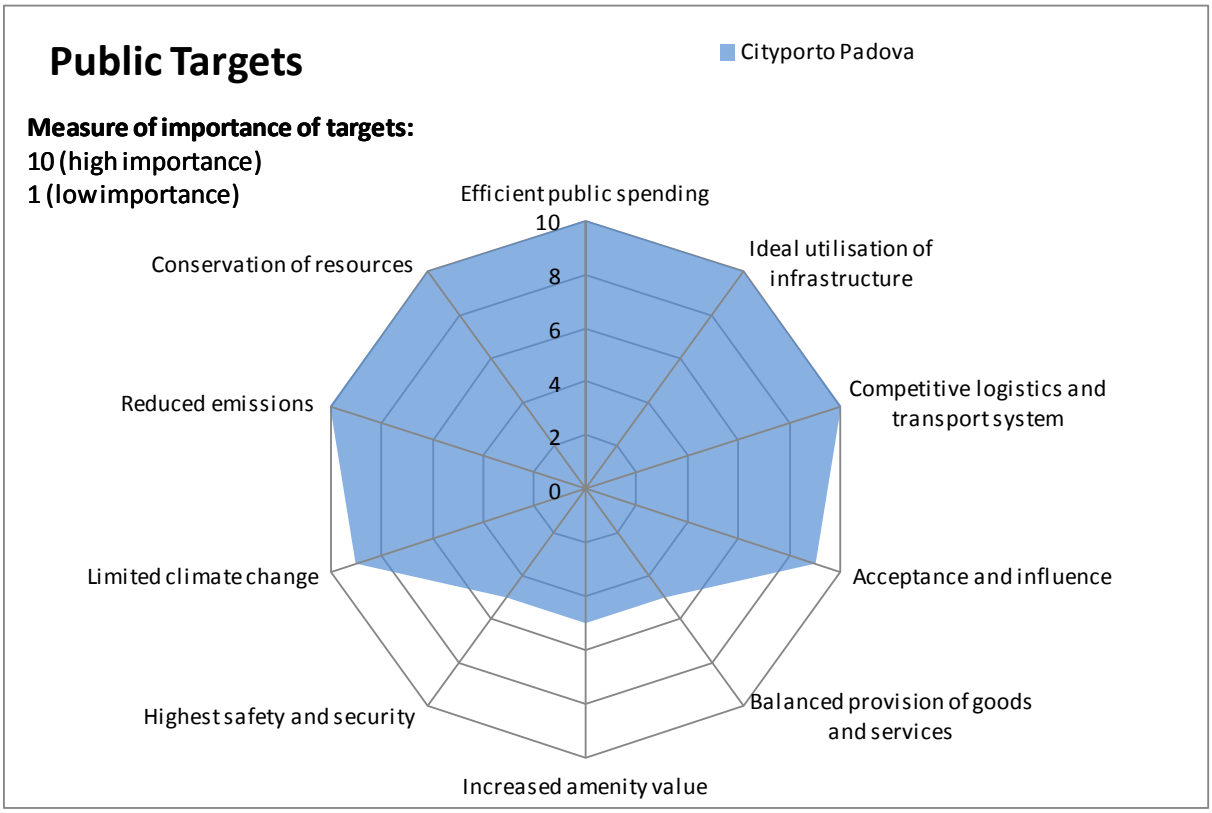


Figure 49: Public sector targets evaluation of Cityporto Padova



3.2.3 The Green Link: last mile with cargo cycles in Paris

1) Basic information	
1.1) Identification CL1_154	The Green Link: last mile with cargo cycles in Paris
1.2) Cluster	CL1 (city logistics)
1.3) Responsible authors	Christophe Rizet, IFSTTAR, Christophe.Rizet@Ifsttar.fr
2) Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transportation business, logistics service (the last mile) provider,
2.3) Geographical Area	France (Paris)
2.4) Implementation status	☐ Evolving Best Practice ☒ Best Practice
	Business of parcels deliveries in central Paris with a fleet of 100% battery electric vehicles is profitable on the market. The Green Link is now operating 3 urban delivery centres (green hubs) in Paris and trying to develop in other towns and other countries
2.5) Date of implementation	Business started in 2009
2.6) Link to other clusters	• E-freight (CL3) for the IT management 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
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 …
	Electric cargo cycles and electric vans
2.9) Supply chain elements	Depot and transhipment operation management, fleet management, delivery management and transport operations
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: …
	Employment
2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reduc-

	tions) ☐ 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: …
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.** The Green Link (TGL) is a transport service provider that uses a 100% battery electric vehicle fleet for its commercial parcels delivery operations. The business is profitable and do not rely on subventions from the public sector. The main distribution centre is located in Central Paris near Gare de l'Est and from there commercial parcels deliveries are made for large companies such as TNT and FedEx in the central boroughs of Paris. Two smaller depots are also run to accommodate different distribution area, and these two depots are located in other central boroughs of Paris. The contributors of flow (TGL's clients) are either shippers (Coca-Cola, Eurodep a pharmaceutical agent specialized in the retail outlet, Saveurs et Vie (see § 5.6) or large express carriers (TNT, FedEx, ...). They connect in the information system to announce the arrivals of parcel to deliver (addresses of delivery, type of parcel). This interfacing (EDI) allows an exchange of documents of multiple formats. With this information and according to the available capacity, delivery tours are optimised. The information system is monitoring the whole process. End of 2013, the volume of parcels distributed is 2,500 per day, and the business is expected to grow to a volume of about 5,000 parcels per day in the year 2014. The growth conditions are limited due to the available size of the current depots. The organisation of the logistics processes is straightforward. The goods arrive in the early morning hours, starting from 07.00, up to 09.30, at the depot. The parcels are coming by truck and vans from the larger regional distribution centres of the clients and then unloaded into the depot via pallets, before being sorted and loaded onto the clean vehicles. The fleet of electric vehicles consists of 2 small electric vans and 28 electric cycles (see pictures below). The distribution rounds are performed by a staff of 60 part-time and full-time drivers. The rounds start in the morning around 09.00 and end in the early afternoon mostly before 15.00. Very few evening rounds are performed for parcels collection. During the delivery tour, information is sent back in real time and can be communicated to the contributors of flow.

	The back office platform (CRM) and the Business intelligence tools allow a good reporting of TGL activity. The organisation structure of The Green Link is based on 1 owner and 1 depot manager. The sustainability impacts of this solution are rather high. Due to the substitution of the diesel van fleet through a battery-electric fleet, the supply chain emissions are strongly reduced, as operations are becoming almost completely emission-free for the final distribution in the part of the city that need it the most: the centre. On the supply chain legs between the suburban depots of the customers and the inner-city depots of The Green Link, the operations are occurring in a more consolidated way, so even if there are diesel vans in use on those legs, the overall load factor and the overall efficiency of the supply chain have increased and thus the energy use and emissions per load unit have decreased. The economic impact and the business benefits are good, and the company has developed a business model based on the successful acquisition of private sector contracts, and the cooperation with large parcel service providers.
3.2) Technical main characteristics	On the physical transport side, TGL is operating 3 depots and a fleet of 30 electrically assisted cargo cycles and 2 electric vans. The 3 depots, called 'green hubs', are located in the centre of Paris. The main depot size is 350 m^2, the two other depots are about 200m^2 surface. Depots are supplied outside rush hours, either by TGL or by the clients, generally by trucks. One of these hubs is located on the Seine river side and can be supplied by waterway. 28 cycles are self-manufactured. The cargo cycles have • A volume capacity of 1.5-2.1 m^3, • An empty weight of about 100 kg, • A load weight capacity of 200 kg (max. 30 kg per parcel), • A gross vehicle weight of 400 kg • a maximum speed of 25 km/h and • An autonomy of 20 km with a lithium battery. There is a possibility to take a supplementary battery in case of a long tour. These cycles are designed and manufactured by TGL. 2 'Goupil' vans are full battery electric powered , with a capacity of 2.5 m^3, 500 kg (a maximum of 30 kg per parcel) a maximum speed of 40 km/h and an autonomy of 100 km with a lithium battery. On the information system side, the central unit is interchanging data with the contributors of flow, in several formats, and pre-organising the delivery tours. The organisational interface scans the parcels at their arrival, consolidates the tours, dispatches the parcels, and sorts them according to their delivery rank in the tour. A web interface enables the real time tracking of deliveries and sends the final delivery report. A mobile application scans the parcel when delivered and send the delivery status.
3.3) Success factors	The main success factors are • a good mix of flows (e.g. one flow of parcels arriving early for delivery in the morning, one in the beginning of the afternoon and a third one later in the afternoon) and an efficient management of the transport chain though the information system

	• Managerial qualities of the owner and depot manager and excellent contacts to local businesses and decision makers. • Availability of space in Central Paris.
3.4) Main benefits	The main benefits are the improved environmental situation, with virtually zero tailpipe emissions, no air pollutants and a very much reduced noise emission during transport operation. Thanks to its electric fleet, TGL claims for delivering daily over 1000 parcels and for having avoided the emission of more than 20 tonnes of CO_2 and the consumption of 130.000 litres of diesel since its creation in 2009.
3.5) Cost indication	The economic benefits for the operator are given. Profitability is reached after few years of operations. The rental costs of the depot can be considered very high, compared to suburban depot rental prices: about 55,000 Euro per year for the main depot, about 20,000 Euro per year for each other two depots.
3.6) Barriers / Limitations	High price of real estate rental in central Paris and limited range and autonomy of battery electric cycles are two main constraints limiting the rapid growth of this business. Even if a contractor would offer a substantial amount of parcels to be delivered, the operative limitations of the depot and fleet size would not allow starting immediately, as the capacity is now close to be fully used.
3.7) Common practice before implementation	Before subcontracting the last mile to The Green Link, each contributors of flow was delivering either by himself or with another 'last mile subcontractor', with diesel vans or trucks. Diesel van fleet were operated, starting every morning from the client's depots, located in suburban area of Paris, at a far distance from city centre. This transport is generating emission along the way in the morning peak, due to congestion on the main axis. The vans were also emitting during the round trip within the city centre area of delivery. These emission problems are now resolved.
3.8) Motivation/ problem	Congestion and air pollution in Paris centre which slowed down the deliveries and made uncertain the usual transport in diesel vans: Very limited clean and small vehicle operations were occurring in the commercial parcels delivery sector in Paris before.
3.9) Justification of practice	The business model is successful and replicable, and the growth prospect of such a viable technology and profitable solution are excellent both for the current business owner and also for potential other start-up companies in other European capital cities. The Green Link is a Best Practice for commercial parcels deliveries under standard business conditions in Paris.
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, re-

	gions or cities (e.g. legal system, language barriers, size)? No
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Not only parcels but also other types of goods such as food, ready-meals or clothes are potentially relevant for this business. If one of TGL clients would try to operate the last mile by himself, he would not have that mix of flows.
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
	Electric vans are very expensive and the depots in central locations are also rare and expensive. Both topics justify that a public intervention would be adequate, for example in form of helping to find a central depot or access allowances to shopping centres or pedestrian zone for electric vehicles during the day, or other land-use related allocation of free parking and storage space reserved for clean vehicles in city centres.
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 green link could be extended to other towns but not in rural areas. It is clearly designed for dense cities. The successful transfer of such type of business did not occur until now in Europe. The Green Link is planning an extension of its operations into other cities. It is not fitted for rural or low density area.
4.5) Similar cases	There are several cases that look similar for the organisation (a depot with cargo cycles for the last mile) : Gnewtcargo in London is a company with a similar business model and both Gnewtcargo and The Green Link demonstrate similar beneficial impacts on the economic, traffic and environmental aspects of their operations. The two companies are not in competition, however, because the local markets are very different.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The available information are very crucial to the further growth of the business and also for the further extension and replication of this business in other conditions and countries.
5.2) References	The Green Link (2013): http://www.the-green-link.com/

5.3) Contact for further details	Michael Darchambeau The Green Link michael.darchambeau@the-green-link.com
5.4) Date of review	27 November 2013
5.5) Pictures	**Figure 50: Electric cycle operation in central Paris, 2013**  **Figure 51: Depot loading and sorting operation at The Green Link, Paris, 2013** 
5.6) Involvement of SME	The Green Link is an SME for last mile logistics. This 'last mile' service can help other SMEs like 'Saveurs et Vie' (Flavours and life, which proposes personalized dietary meals): Together with 'The Green Link' they won a call

	for tenders from the municipality of Paris for delivering old person meals at home.
5.7) Impact on SME	The main impact of the SME, besides further developing the company itself into a larger business, rely in its potential of developing this kind of Best Practice activity and replicate the business model of the start-up phase on other markets, other French cities and in other countries. TGL might be suited for home deliveries together with other services at home as it is in the case of 'Saveurs et vie'.
6) In-depth information	
6.1) Costs	• What are the (estimated) costs (e.g. investments, operation) The main cost of this activity is manpower and the rent of the depot. The 'normal' delivery tour per working day for a cargo cycles driver is 5 hours, including one hour for preparation, loading and a posterior control. During this tour, the usual number of deliveries is 48. The cost of a cargo cycle driver is 13€ per hour; In the depot, there is a team leader for 10 cargo-cycles. Its cost is approximately 100 € per day, i.e. 10 €/ cargo-cycle per day. We add 20 % to these manpower cost to take into account days off, training and other absences The current rent of the central depot in Paris is 210€ per working day; this amount can vary a lot according to the depot situation in town and to the surface. This cost is distributed among the various activities. We assume here that there are 2 * 10 cargo cycles tours per working day; The average cost per delivery is then Manpower: 1.2* [(5h *13) + 10] / 48 = 1,88 € Depot rent: 210 /(10*48*2) = 0,22 € The cost of a new cargo cycles is 7000 €; with the maintenance approximately 10€ per working day. The other fixed costs are insurance, accounting, and management. • What financing is presently applied/planned (partnership, private, public funding) The financing is currently private. Help from the municipality would be desirable to find a good depot at a reasonable price.

<table>
<tr><td>6.2) Benefits / Strengths</td><td colspan="3">
Cost-benefit ratio, cost per output unit, share of private investments
The recipe is 3€ per parcel delivered, out of which the company has to pay manpower 1.88 €, depot 0.22. The remaining money (3- (1.88 + 0.22) = 0.9 € per parcel has to pay the other fixed charges and the benefit.
Utilisation rate of networks, time losses
Deliveries generally have to be done between 9 h and 13h30. The cargo-cycles and their drivers are less occupied in the afternoon. The drivers have part time working contract (generally 5 hours/day).
Profits, debt
The profitability is good.
Units per delivery, mileage per delivery, total mileage
About 48 deliveries per day, at 20 km per day, makes about 0.4 km per delivery
Developed market size, market share
The market share of cargo cycles in total parcel deliveries in Paris is still very small (less than 1%) for the moment.
Frequency of service, access times to networks, accessibility
No. of accidents, no. of incidents with hazardous goods
CO2 emissions, GHG emissions, emitted pollutants, noise emissions
No emission from combustion (neither GHG nor local pollutants); the noise is very reduced.
Energy used, space used, sealed surface
Other benefits?
Employment: Average of 60 employees in 2013.
</td></tr>
<tr><td>6.3) Challenges</td><td colspan="3">
What are the main challenges of the project, concept, strategy, initiative?
What are the main risks?
Are there undesired secondary or external effects?
</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: …

The preparation of a new cargo cycle activity needs at least one client, and contact with the municipality to find a depot,</td><td>2. Implementation: …

The time of implementation of a new cargo cycle site is estimated 3 months: to fit out the depot, make the cycles and manpower training.</td><td>3. Operation: …

The cargo cycle operation is then easy but hast to be managed and checked carefully.</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?

The management is very important</td></tr>
<tr><td>6.5) Process</td><td colspan="3">Please give detailed information on the process of implementing the best practice. How was the initial process and experience and what can be expected for (future) transferability?</td></tr>
</table>

6.6) Technical feasibility	Is this practice feasible in technical terms? Yes the feasibility is given (there are many cargo cycle companies all around the world.
7) Cluster specific information	
7.1) Before-after comparison of distribution systems	*Graph of the distribution system before and after trial starts, if available*
7.2) Before-after comparison of impacts	*For example in* *km per parcel (distance),* *kWh per parcel (energy),* *CO2 per parcel (emissions) , (all if available)*
7.3) Before-after trial description	*Which solution was tested, when, where, from whom, how (max ½ page) (if available)*

8) Evaluation of strategic targets

Figure 52: Importance of private sector target for The Green Link Best Practice

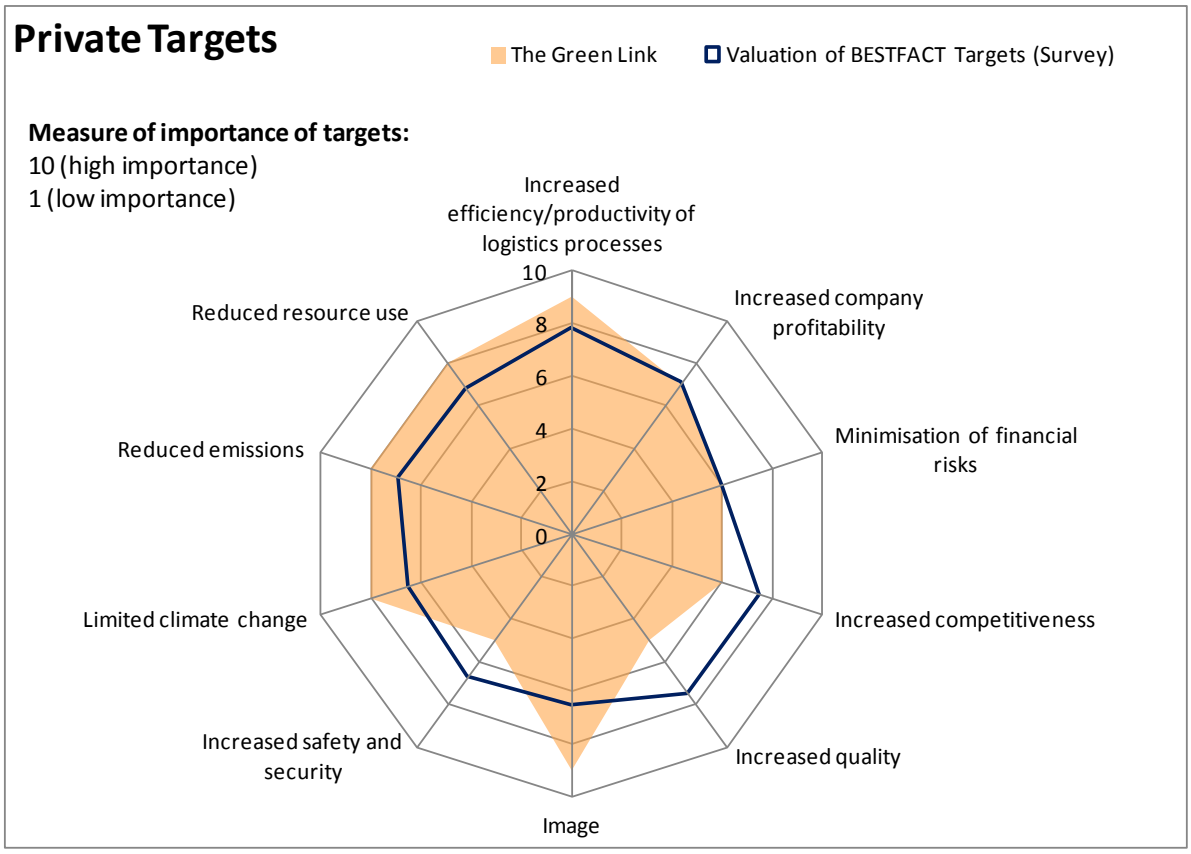
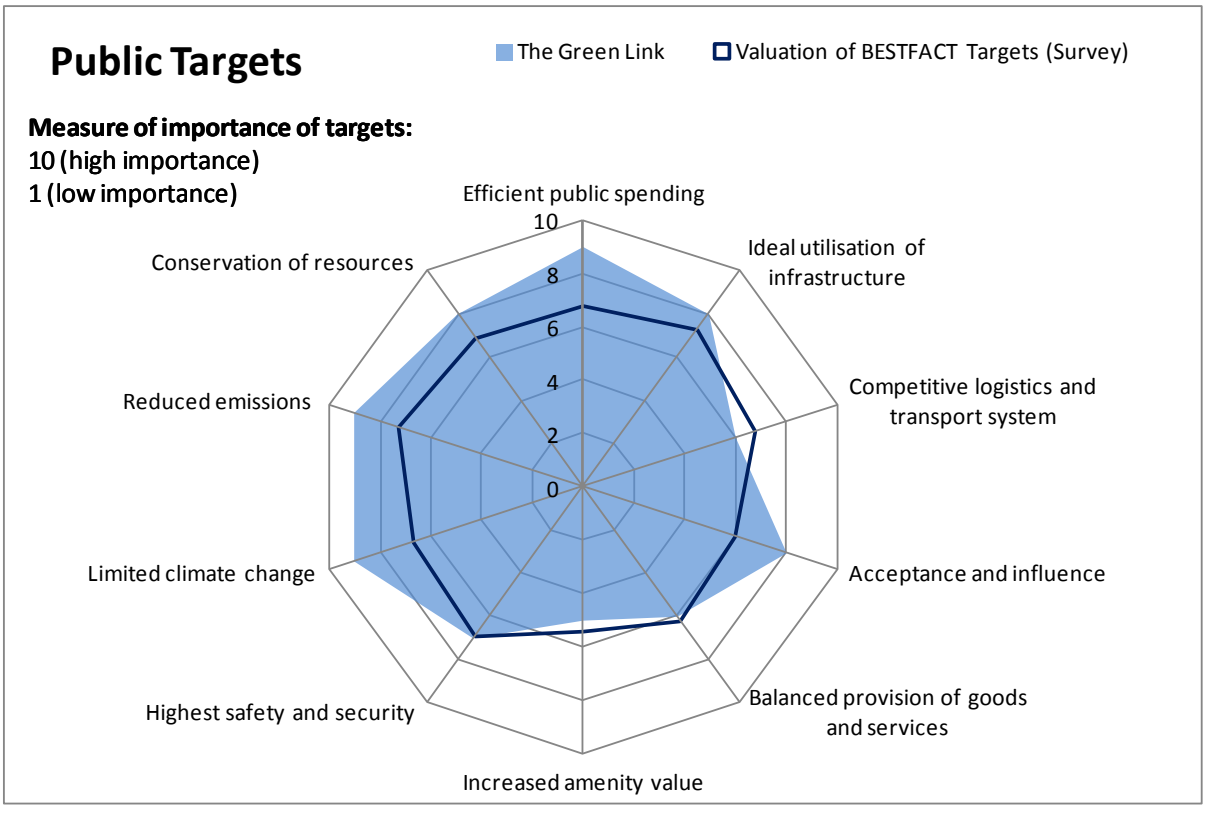


Figure 53: Importance of public sector targets for The Green Link Best Practice



3.2.4 Gothenburg City Logistics Initiatives

1) Basic information	
1.1) Identification CL1_157	Gothenburg City Logistics Initiatives
1.2) Cluster	Urban Freight
1.3) Responsible authors	Maria Lindholm, Lindholmen Science Park/CLOSER, Gothenburg Jacques Leonardi, University of Westminster, London
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	Local authority, Industry, Commerce, Transport operators, Property owners, Trade associations
2.3) Geographical Area	Sweden (Gothenburg)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	The Gothenburg City Logistics initiatives were already successfully implemented and are ongoing (in various stages).
2.5) Date of implementation	What year (or more specific date if possible) was the new solution implemented? 2005 – The local freight network (urban FQP) 2008 – The micro terminal at Lindholmen (consolidation centre. Fully commercial since 2011) 2009 – "Walking speed areas" on streets in city centre (making deliveries easier). 2009 – Length restriction for vehicles in the city centre (10 m) 2012 – The consolidation centre "Stadsleveransen" in the city centre. Going into up scaling phase 2013/2014. 2013 – "The fish express": using a vehicle similar to the one used by stadsleveransen in order to transport fresh fish from the fish auction to the city fish market (cooperation between five businesses selling fish at the market). Under development.
2.6) Link to other clusters	• Green Logistics (CL3) • 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
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	A consolidation centre/terminal is used for Stadsleveransen as well as for

chain elements	the micro terminal. Goods are unloaded from a bigger truck in to the terminal, registered and then loaded on to a small electric vehicle or electric bike (Stadsleveransen). There is a possibility to use the terminal as a temporary warehouse for some goods by retailers.	
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) 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	The City of Gothenburg developed and applies a bundle of city logistics policies and solutions, starting from the regulation of city centre and shopping area, using consolidation centres and clean vehicles, developing trials of innovative solutions, monitoring and data collection on new vehicles and new technologies. The solutions have been developed and are supervised by a well-established network of expert.	

3.2) Technical main characteristics	Stadsleveransen: The project started in 2012 with a small-scale pilot action during half a year. A small number of shops were contacted (8-10) and asked to redirect their goods through the consolidation centre (using a c/o address). The consolidation centre was set up as a small terminal in the city centre, located in an existing parking garage and a small electric vehicle was used to deliver the goods to the retailers using the terminal. Responsible for the terminal is the trade association of the retailers in the city centre. The terminal was operated by a security company (security guards). The pilot was during this phase mainly financed by projects, the local authority and the trade association together with a property owner in the city centre. During 2013 the pilot was scaled up and more streets in the city centre were involved in the pilot. In this phase the focus shifted from the retailers to the haulers and two of the haulers with biggest market share in the area did now redirect their goods to the area through Stadsleveransen. This increased the number of receivers of goods to 160 as well as the amount of goods. Up to November 2013 the number of receivers are 200 and discussions are also held with a third hauler to be involved in the demonstration. To help with distribution of the increased amount of goods, a transport company using electric cargo bikes have been added to the terminal. During this phase, additional funding of the demonstration came through selling marketing areas on the vehicle – a solution that serve as an important part in the business model of Stadsleveransen. During next phase the area will be increased, the terminal will be moved to a better location with larger space, and the solution will cost money for the haulers or transport operators that chose to use Stadsleveransen instead of performing the deliveries by themselves. Micro terminal Lindholmen: The micro terminal started during the START project in 2008 as a small consolidation solution for a campus area, but have since 2011 been fully commercial with 14 companies (increasing) connected to the terminal. The terminal are handling goods receiving/distribution and waste management (clean waste) and also mail. The terminal is operated by the service manager of the properties. Local freight network: The local freight network in Gothenburg was established as a part of the EU project START in 2005. Since then it has been developed and now has regular meeting 3-4 times per year gathering 20-25 participants from transport operators, trade associations, local authority, academia, property owners and retailers. The local freight network is a type of partnership, where the purpose so far has been to share knowledge and experiences between the participants as well as addressing specific problems arising within the central parts of the city aiming at finding solutions. Specific outcomes of the partnership have been • the introduction of a length restriction in the city centre, • walking speed area streets,

	• a parking and unloading practice guide. However, the most important outcome is the long-term interaction between the stakeholders that are involved in urban freight transport, the improved dialogue and the possibility to discuss and find solutions to everyday problems that are occurring in an easy way through direct contacts between stakeholders.
3.3) Success factors	Communication and Cooperation between partners were key for the success in establishing new city logistics measures such as the consolidation centre and the electric vehicle project. The consultation activities were extensive and a high number or hours have been spent by the municipality service and the project management discussing the potential solutions and different approaches with receivers of goods/retailers, hauliers and transport operators. For this it was possible to rely upon a good network of local experts. The technical solution is feasible.
3.4) Main benefits	The main benefits are the environmental benefits associated with the use of clean vehicles, especially lower pollutants emissions, low noise and reduced CO_2 emissions. The other benefits are in the existing established stakeholder participation that enable to react to changes and new developments more effectively.
3.5) Cost indication	The initiatives have been supported by the Swedish Government and the Municipality of Gothenburg during the set-up and starting phases.
3.6) Barriers / Limitations	Main difficulty is to obtain an agreement of businesses and retailers to use the UCC and the clean vehicles, as it is requested that some of their long-term, established business customers relationships need to change. Second main difficulty is to cover the additional costs associated with the use of electric vehicles instead of diesel.
3.7) Common practice before implementation	Deliveries were made previously by diesel trucks and vans, originating from different suburban depots.
3.8) Motivation/problem	Need to develop clean solutions was key.
3.9) Justification of practice	The Gothenburg city logistics initiatives can be considered a Best Practice because of the organisation of the UCC and clean vehicle use in combination with many other city logistics actions such as partnerships, planning, vehicle testing, and access restrictions. The strongest point of this Best Practice is to have developed a multiple set of good solutions and to have integrated them into a coherent, global framework of city logistics activities.
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No

	Network and partnerships are well established managerial solutions. The electric vehicle technology can be purchased and used in other cities.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	City Logistics has a need for variable involvement of different stake-holders from industry, retail, transport and public sector, depending on which city and which project are being considered. The stakeholders are mentioned above in the description. The electric vehicles were first used for parcel distribution, then for recycling, and now for fresh food transport. It is expected that more branches of economic activities and different types of retail can benefit f
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 fully compatible with existing legislation and market practices.
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 extension to other cities is feasible, subject to organisational or political decisions.
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. Similar UCC developments combined with electric freight vehicles are in operation in many other cities in Europe. The particularity of Gothenburg is to have organised the UCC in combination with many other City Logistics actions such as partnerships, planning, vehicle testing, access restriction and others, as described above.
5) Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The long term dimension, the coherence, magnitude and strength of the approach, the diversity of the actions, the managerial innovation are very positive elements that would be worth investigating further. The transparency of the cost situation might become a difficulty when assessing the economic impacts and the business benefits.
5.2) References	SENDSMART (2013): http://www.lindholmen.se/sv/vad-vi-gor/closer/sendsmart-ett-projekt-hallbara-godstransporter-i-stadsmiljo

	Stadsleveransen (2013): http://innerstadengbg.se/innerstaden-goteborg/projekt/stadsleveransen/
5.3) Contact for further details	Maria Lindholm SENDSMART project manager Lindholmen Science Park AB Tel 031-764 70 19 maria.lindholm@lindholmen.se
5.4) Date of review	14 November 2013

5.5) Pictures

Figure 54: Road network and main delivery areas in the City of Gothenburg

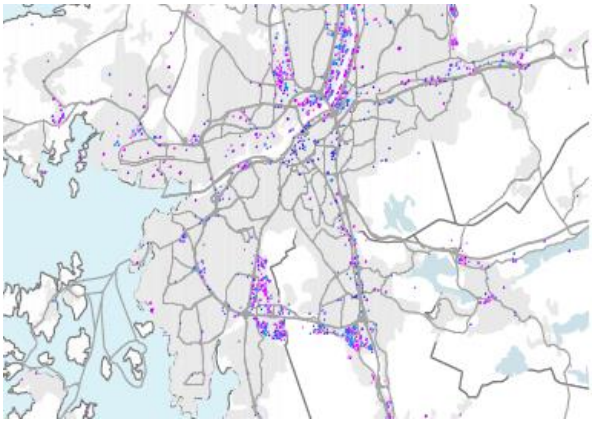


Figure 55: Stadsleveransen: Logo

Figure 56: Operative vehicles of Stadsleveransen used in Gothenburg

Figure 57: The micro terminal Lindholmen in Gothenburg

	 *Source: Stadsleveransen (2013)*
5.6) Involvement of SME	SMEs are part of the project, e.g. the electric cargo bike company (Move By Bike) that have been added to the terminal Stadsleveransen.
5.7) Impact on SME	SMEs benefit from the project participation and from the future growth prospects of developing more clean transport operations in the city centre of Gothenburg.
6) In-depth information	
6.1) Costs	• What are the (estimated) costs (e.g. investments, operation) The costs for purchase of an electric vehicle and for the annual rental of the depot are following: The cost for the vehicle is about 33,000 € (of which the trailer is 8,000 €). The rent for the depot is slightly below 12,000 € annually. • What financing is presently applied/planned (partnership, private, public funding) Is Stadsleveransen expected to become a self sustained profitable business in near or medium term future? Stadsleveransen is expected to become a self sustained business within 2-3 years. One option is that Stadsleveransen will be kept as a non-profit business within the merchant joint company Innerstaden, and another option is that the business will be supplied by an external service provider.
6.2) Benefits / Strengths	The main impact from the view of the serviced final user is the reduced time spent on the street and in front of the facility for loading and unloading by distribution vehicles. The number of vehicles haven´t yet decreased in any perceivable extent. Another clear result is of course less time consumption for the

<table>
<tr><td></td><td>transport companies (delivering to Stadsleveransen instead of a number of drop points in the area).

A trial impact assessment was performed by Chalmers University on the impact of the parcels delivered via the UCC of Stadsleveransen. For the assessment, the data were collected, and then the "before"-situation was constructed and the changes calculated.

The results give an indication of some effects, but they need to be used with care, since they are based on several assumptions (load factors, number of shipments, number of receivers, routes, etc).

Furthermore, the data was collected in July, which is the holiday season in Sweden, and hence transport volumes were significantly lower as usual.

The measures effects are therefore probably lower than they are in autumn and during the Christmas period as the UCC handles much bigger volumes. It is hoped that the same assessment will be done again in December, which would give more reliable results.

The measured effects are:

Limited effect (probably due to low season/limited volumes)
• Only 10 out of 55 receivers get multiple deliveries
• 82% of retailers are delivered by a single operator

Still on average positive effects in the UCC distribution area are visible (average values per retailer and week):
• Number of deliveries: -12% (2.4 --> 2.1)
• Handling time: -13% (minutes per delivery: 9.7 --> 8.5)
• Shipment size: +14% (number of boxes per delivery: 2.8 --> 3.2)

Also positive effects on transport operators (av. values per vehicle trip)
• Traffic volume and distance: -2% (veh.km: 26.0 --> 25.4)

Vehicle time: -7% (hours per delivery round: 4.6 --> 4.3)</td></tr>
<tr><td>6.3) Challenges</td><td>The main difficulty is to create a sustainable business model and financing
structure for the future.

It´s a quite complex situation, where a number of stakeholders are supposed to finance the business in reasonable amounts in the future, and where some predicted revenue streams are a bit uncertain.

Technically, there are no major challenges at present.</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">Which actors are relevant in the process?</td></tr>
</table>

6.5) Process	Please give detailed information on the process of implementing the best practice. How was the initial process and experience and what can be expected for (future) transferability?
6.6) Technical feasibility	Is this practice feasible in technical terms? Yes, no technical challenges.
7) Cluster specific information	
7.1) Before-after comparison of distribution systems	*Graph of the distribution system before and after trial starts, if available*
7.2) Before-after comparison of impacts	*For example in* *km per parcel (distance),* *kWh per parcel (energy),* *CO2 per parcel (emissions) , (all if available)*
7.3) Before-after trial description	*Which solution was tested, when, where, from whom, how (max ½ page) (if available)*

8) Evaluation of strategic targets

Figure 58: Importance of private targets for the implementation of the Gothenburg BP

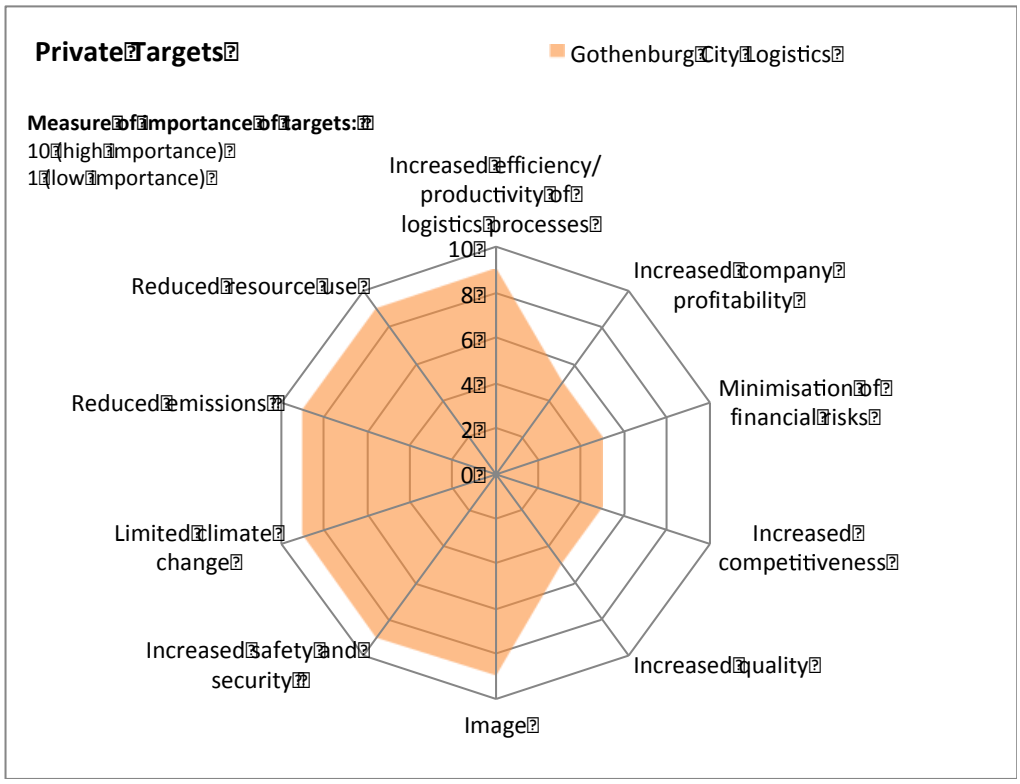
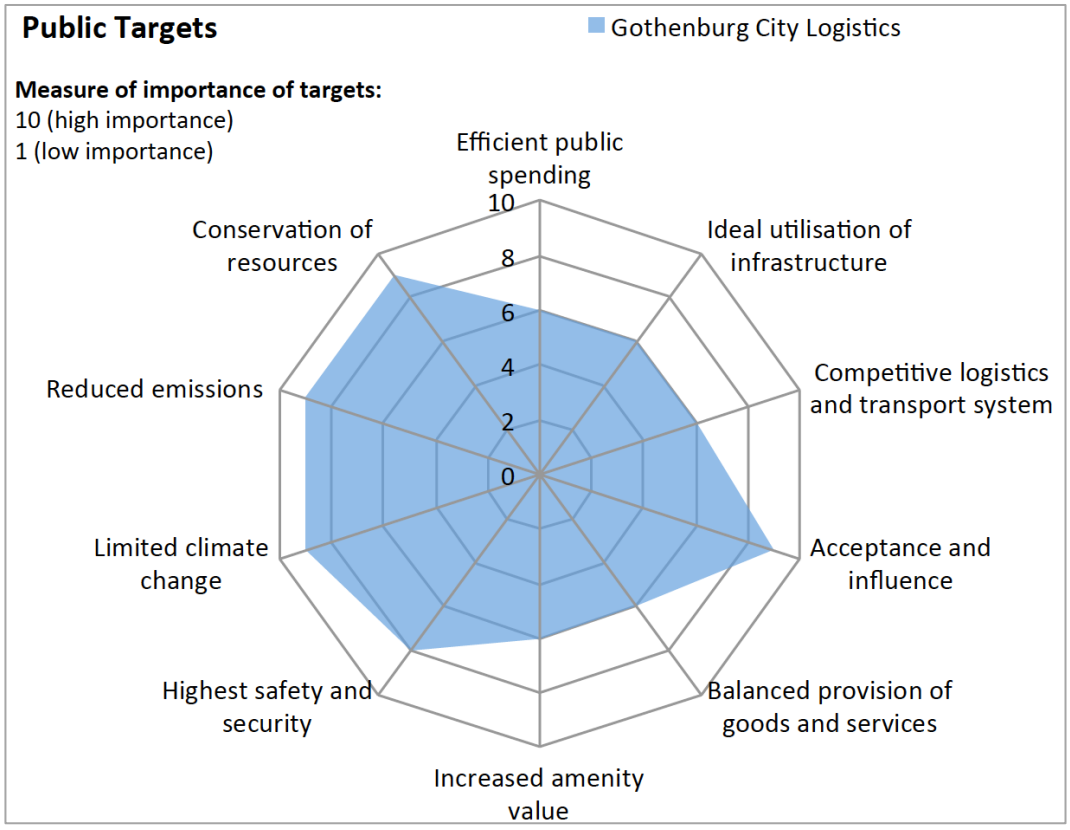


Figure 59: Importance of public sector targets for the Gothenburg Best Practice



3.2.5 Clean Vehicle Use in Donostia San Sebastian

1) Basic information	
1.1) Identification CL1_156	Urban freight distribution in San Sebastian
1.2) Cluster	Cluster 1. Urban freight
1.3) Responsible authors	Dolores Herrero - ITENE Patricia Bellver - ITENE
2) Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	- San Sebastián City Council - IVL-LEE – Instituto Vasco de Logística (Basque Institute of Logistics) - Gea 21 - EHU - Universidad del País Vasco (Basque University) - Txita - DBUS
2.3) Geographical Area	Spain, San Sebastián
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	Fully implemented and operating
2.5) Date of implementation	June 2010
2.6) Link to other clusters	• This kind of distribution is connected with cluster 2, related to green 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
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 …
	Mainly bikes, due to their use to deliveries but also delivery vans, being them reduced by the initiative.
2.9) Supply chain elements	The solution involves mainly the elements of transport and warehousing

<table>
<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>
<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 colspan="3">3) Best practice</td></tr>
<tr><td>3.1) Description of the practice</td><td colspan="2">This measure consists in the implementation of a goods distribution model with less negative impacts on the inhabitants and urban space.
A research study was conducted in Donostia - San Sebastián and the design of this was related to urban goods distribution. Elements analysed were:
- Incidents that occurred during loading and delivery
- Infrastructures and other means for shops and transport companies
- Emissions and noise related to urban goods transit, consumption of energy and traffic density</td></tr>
</table>

	- Traffic control system Following the recommendations, an implementation plan was developed including the following measures: - Creation of a freight consolidation centre for the last mile distribution of goods - Use of clean vehicles for last mile distribution - Regulatory options to improve loading behaviour - Increased control in the use of loading bays - Design of a night distribution protocol - Use of new technologies to make easier the communication between the distributors and the local shops Finally, two measures were completely implemented: - Creation of a freight distribution centre - Use of bikes for deliveries
3.2) Technical main characteristics	- Municipal warehouse perfectly equipped for reception and dispatch of goods with ecological vehicles. Located in the San Sebastian City Centre with approximately 500 m2 of space. Goods delivery system using electric cargo bikes. These vehicles are sustainable and adapted to the urban reality that offer innovative operational in urban freight distribution, extending service hours and eliminating CO_2 emissions.
3.3) Success factors	There exists some different factors which convert this initiative in a successful one: - The preparation of the measure in co-operation with local stakeholders. - The elaboration of a diagnostic study that also includes opinions and ideas of the stakeholders - The pilot experience. - Combine new services and new regulations with improved enforcement. Combine implementation with mayor communication campaign.
3.4) Main benefits	Main benefits of this project are: - Reduction of trucks within the city. - Reduction of GHG, noise and air pollution. - Reduction of traffic congestion. - Extension of hours of loading and unloading without causing any problems to the neighbours, mainly in the Old Town. - Improvement of ecological position of the City of San Sebastián. The new delivery regulation for goods contributed to a reduction in the average journey length of delivery vehicles by approximately 0,5 km. The new last mile delivery service with electric cargo-bikes saved up to approximately 27,000 km per year. As a consequence, a yearly reduction of

	22% in energy consumption was achieved, in addition to a significant reduction of carbon and pollutant emission levels. Regarding society indicators, surveys conducted reveal that nearly half of the involved population (neighbours, shopkeepers and transport operators) were aware of the initiatives put in place.
3.5) Cost indication	Here are shown some approximate costs of bike deliveries. - E-bike purchase price: 7250€ + VAT + transport - Maintenance: 30 €/month-bike Insurance: 125 €/year-bike
3.6) Barriers / Limitations	<u>Limitations related to stakeholders:</u> The main problem in San Sebastián was dissatisfaction of some businesses about the new arrangements because of the changes that were required in relation to transport services. On the other hand, some supermarkets don't agree with pilot test conditions and they don't respect the regulations set out on it. <u>Limitations related to bikes:</u> - City Orography: on very steep slopes it could exist problems with bikes - Load capacity up to 100-150 kg - Bike battery autonomy (about 8 h charging) - Need distribution centre where performing load break and transfer to bike located within coverage area radius distribution. - Coverage radius bikes: o Medium load (70 kg): Up to 3 km from distribution centre. o Packages: Up to 6 km from distribution centre. o Light merchandise: Up to 8 km from distribution centre.
3.7) Common practice before implementation	- There were streets in the area exceeding the decibel limit established as quality goal. Noises that were largely related to traffic levels and in relation to the urban distribution raised the need to control the technical characteristics of the vehicles, among others. - The distribution of goods was very problematic, existing two conflictive areas: Old Town and City Centre, with narrow streets, high number of stores and lots of restrictions in deliveries. There was no homogenization of the loading and unloading times within different sections of the same street, which generated a great deal of confusion among users.
3.8) Motivation/problem	San Sebastián has a strong commercial and social activity, surrounded on its periphery with numerous industrial sites that generate a significant flow of goods, vehicles and people to the city centre. Before the project, the city centre had a high volume of traffic, noise and pollution due to freight transport.
3.9) Justifica-	It can be considered as a best practice because it includes all aspects

tion of practice	that define it: - Innovative and feasible: It supposed a revolution in San Sebastián City and it is still operating since 2010 and expanding. - Business and policy objectives: It was developed by the city council and operated by the private company "Txita". - Positive effects on business and policy targets: It is in concordance with governmental strategies and represents high benefits to companies. Transferability: It was transferred to other Spanish cities (i.e. Barcelona with "Vanapedal")
4) Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	It is necessary to consider orography. On very steep slopes it could exist problems with full loaded bikes.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	It can be transferred to mail or packages delivery
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
	Directive 2002/24/CE for electrical bikes certification
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 could be possible only with the creation of new distribution centres, because of coverage limitations.
4.5) Similar cases	Txita has extended their services to other cities like Bilbao. The Txita company has already "exported" the service to various other Spanish cities (i.e. Barcelona: VanaPedal, http://www.vanapedal.es)
5) Additional information	
5.1) Consideration for in-	Should this case be further considered for in-depth review? ☒ Yes ☐ No

depth analysis	It is an initiative fully implemented and nowadays working and expanding. Moreover, contact persons are willing to collaborate. This project delivers a transparent public sector supported operation including reliable costs and benefits data.
5.2) References	www.donostia.org www.txita.com www.citet.es www.civitas-initiative.org
5.3) Contact for further details	Fermín Echarte Técnico de movilidad - Ayuntamiento de San Sebastián fermin_echarte@donostia.org 0034 943481449mailto:
5.4) Date of review	29/11/2013
5.5) Pictures	 **Figure 60: Cargocycle vehicles in operation in Donostia San Sebastián**
5.6) Involvement of SME	- The company who delivers products with e-bikes, called Txita. - All SME's who use this system to distribute their goods.
5.7) Impact on SME	- It makes possible the distribution of goods without limitation in time or zones. - It is a sustainable mode, which allows reducing fuel consumption.
6) In-depth information	
6.1) Costs	It is necessary to consider following costs in Euro: - Investment costs: vehicles purchase, premises conditioning, telecommunications infrastructure …

2010	2011	2012
30,780.04	43,990.98	7,015.88

- Maintenance costs: reparations, printing, computer, phone, clothing, utilities

2010	2011	2012
6,333.83	14,276.11	11,327.42

- Staff costs

2010	2011	2012
36,160.22	111,066,68	40,131.35

Moreover, it could be considered the approximated cost per bicycle, taking into account:

- E-bike purchase price: 7,250€ + VAT + transport
- Maintenance: 30 €/month-bike
- Insurance: 125 €/year-bike

6.2) Benefits / Strengths

As it can be seen in the table below, if the concepts included in the project were the only elements considered (partial results), the balance cost-benefit would be negative, however, there are other incomes not considered for the project (use of bikes out of San Sebastián City) that provide a more real result.

Table 4: Expenses and incomes balance of San Sebastián BP solution

Concept	2010	2011	2012
Expenses	***-69,920.05***	***-164,553.08***	***-55,851.06***
Suppliers	-33,759.83	-53,486.40	-15,719.71
Staff	-36,160.22	-111,066.68	-40,131.35
Incomes	***67,294.85***	***108,643.88***	***34,581.22***
Invoices	23,294.85	71,781.38	34,581.22
Subsidy CIVITAS	40,000.00	30,000.00	-
Subsidy EVE	4,000.00	5,690.00	-
Subsidy Webpage	-	1,172.50	-
Partial result	***-2,625.20***	***-55,909.20***	***-21,269.84***
Other incomes	41,432.70	121,463.59	7,655.84
Result**	***38,807.50***	***65,554.39***	***-13,614.00***
TOTAL*			**90,747.89**

	* Data from June 21th 2010 to June 20th 2012 ** It should be consider other little expenses due to use of bikes out of San Sebastián City (we don't know this cost) Moreover, after the implementation of the measure of distribution in Donostia - San Sebastián, an amount close to 13 tonnes of CO_2 were saved directly. It can be ensured that the implementation of the measure "Txitrans" represents a significant environmental improvement.
6.3) Challenges	Main challenges of the project are all related to the dependence on: - Initial investment - Carriers involvement - Stakeholders implication - Difficulties to compete with self employed carriers (low fares) - Difficulties to find premises with good access to place distribution centre However, the project has numerous strengths: - Political commitment - Bike lanes in the city - Reduction of CO_2 emissions - Noise reduction - Access by bike where other vehicles can't access - Good image for the city - Increase of the bike importance - Commercial support and funding of the service - Constant contact with the company and municipal support
6.4) Implementation steps	What are the different actions necessary in the implementation steps and how long does each step take (estimates)?

1. Preparation:	2. Implementation:	3. Operation:
- Searching premises to place the distribution centre - Finding funds for the project launching.	- Preparation of the scenario for tests - Starting the pilot experience - Operations during 3 years	- Developing activity without funds - Maintenance or increase of vehicles and staff - Expand business (new projects or initiatives)

Main actors involved in this process are:
- Authorities: San Sebastián City Council.
- Distribution company: Txita.
- Users: Shops and trades who send their products.

6.5) Process	1) The process starts with the searching of a premise to place the distribution centre used by Txita for the good's deliveries (without cost for Txita). 2) A "pilot" experience was developed, with a budget of 70,000 € for the launch of the service (year 2010). 3) During 3 years the pilot experience was runningwith funds. 4) Once finished the pilot experience, Txita was self-sufficient to develop its activity without funds. 5) After the initial investment, cost increases proportionally to demand. 6) For the daily deliveries, Txita use the initial premise, without additional costs for the company. 7) Nowadays, the company is using 5 tricycles (initially 8) and they are developing an own prototype. 8) Company is composed by 4 dealers and 2 other persons (management) that eventually work as dealers. 9) Next steps are focused on "Cyclelogistics Ahead" project, which will start on May 2014. This project will involve San Sebastián council and the company 'Txita', with an expected duration of 3 years.
6.6) Technical feasibility	This practice is totally feasible. Nowadays Txitas company is operating and economically self-sufficient, working in other projects and expanding its market to other cities.

7) Cluster specific information

7.1) Before-after comparison of distribution systems

Figure 61: Logistics flows before UCC and clean vehicle use in Donostia

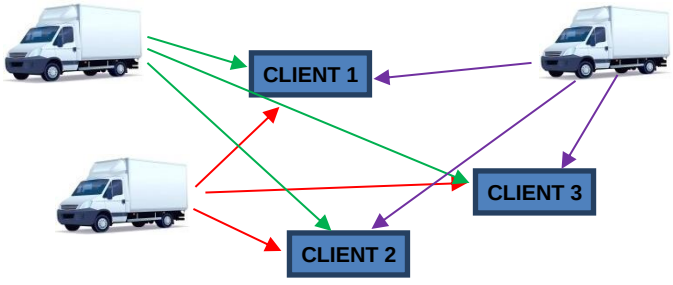
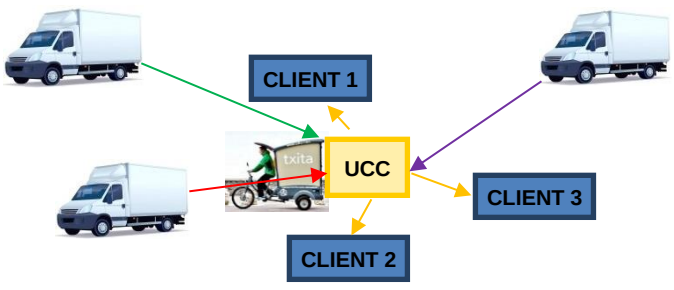


Figure 62: Logistics system after start of the Donostia solution



7.2) Before-after comparison of impacts	The new delivery regulation for goods contributed to a reduction in the average journey length of delivery vehicles by approximately 0,5 km. The new last mile delivery service with electric cargo-bikes saved up to approximately 27,000 km per year. As a consequence, a yearly reduction of 22% in energy consumption was achieved, in addition to a significant reduction of carbon and pollutant emission levels.
7.3) Before-after trial description	This solution was tested in San Sebastián (Spain) with the collaboration of the city council and the private company Txita'. Test experience continued during 3 years, reporting good results. Before the project development, the distribution of goods (now distributed by Txita) was performed with conventional motor vehicles. At this moment, vehicle used are electric cargo-bikes.

8) Evaluation of strategic targets

Figure 63: Importance of private targets for the San Sebastian Best Practice

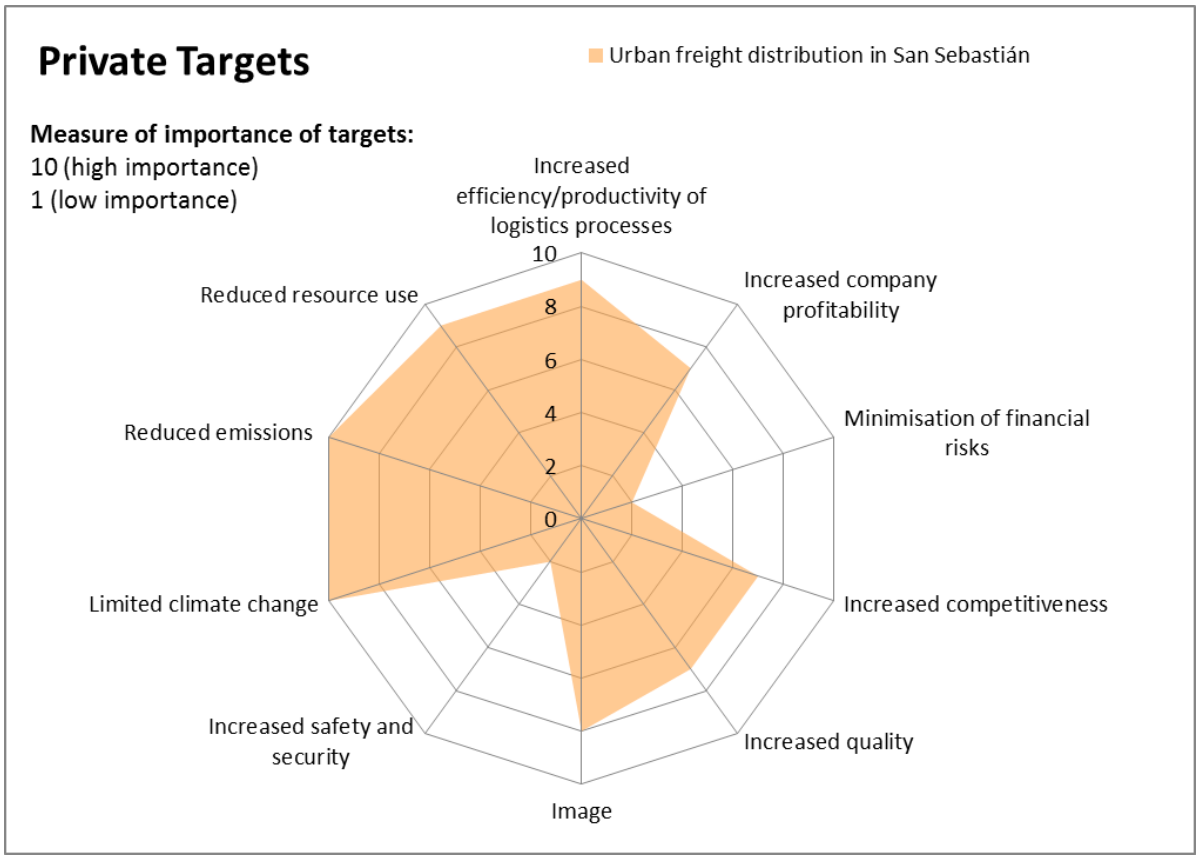
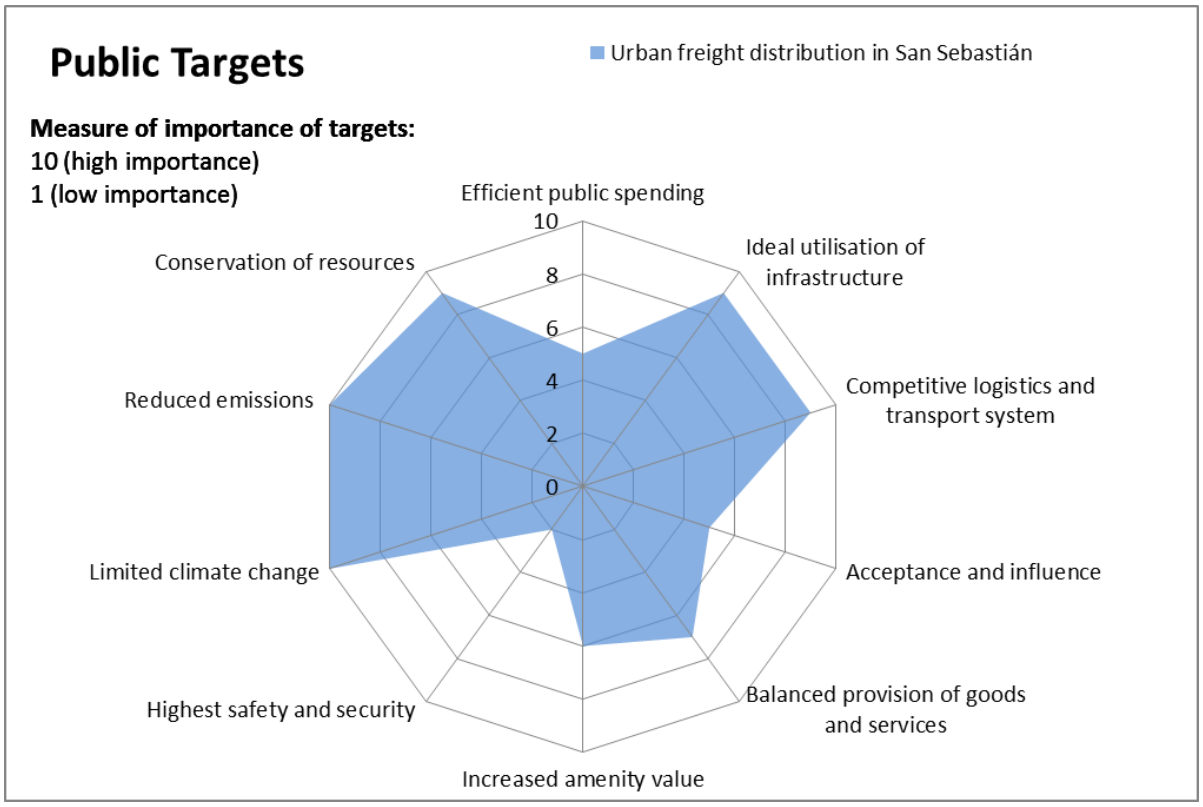


Figure 64: Importance of public sector targets for the San Sebastian Best Practice



4 Synthesis within the cluster

4.1 Topics covered

Table 5: Coverage of CL1 Best Practice cases inventoried in 2013 according to BESTFACT topics

Topics covered in Cluster 1	Number of inventories
Infrastructure and Technology	
Access to transport networks, infrastructure and nodes	6
Freight consolidation and transhipment	10
Implementation of low emission technologies	15
IT-technologies and solutions (for management and administration)	10
Innovative vehicles, vessels and equipment	12
ICT (e.g. routing, guidance), transport optimisation	7
Organisation and Cooperation	
Business to business (B2B) solutions, cooperation	7
Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes)	10
Communication between authorities: cooperation, procedures, legal frameworks	6
Communication between businesses and authorities: coordination, consultation	13
Business models: new form of ownership, risk management	4
Operations and Services	
Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery)	15
Innovative operational solutions	15
Value added services, development (or extension) of services	3
Service quality and sustainability agreements/certification	6
Transport management, fleet management	9
Regulations and Policy	
Access rules and restrictions of urban areas	12
Land use and spatial planning: assessment and siting of transport facilities and infrastructure	2
Infrastructure financing: taxation, user charges, PPP	1
Environmental standards and policy	5
Interoperability and standardisation: vehicles, equipment, loading units, infrastructure	6
Safety and security: measures, regulations, insurance	4
Knowledge, Tools and Methods	
Modelling and forecasting	1
Data collection and statistics	9
Education and training	3
Working and implementation guidelines	3
Monitoring and benchmarking of processes	8

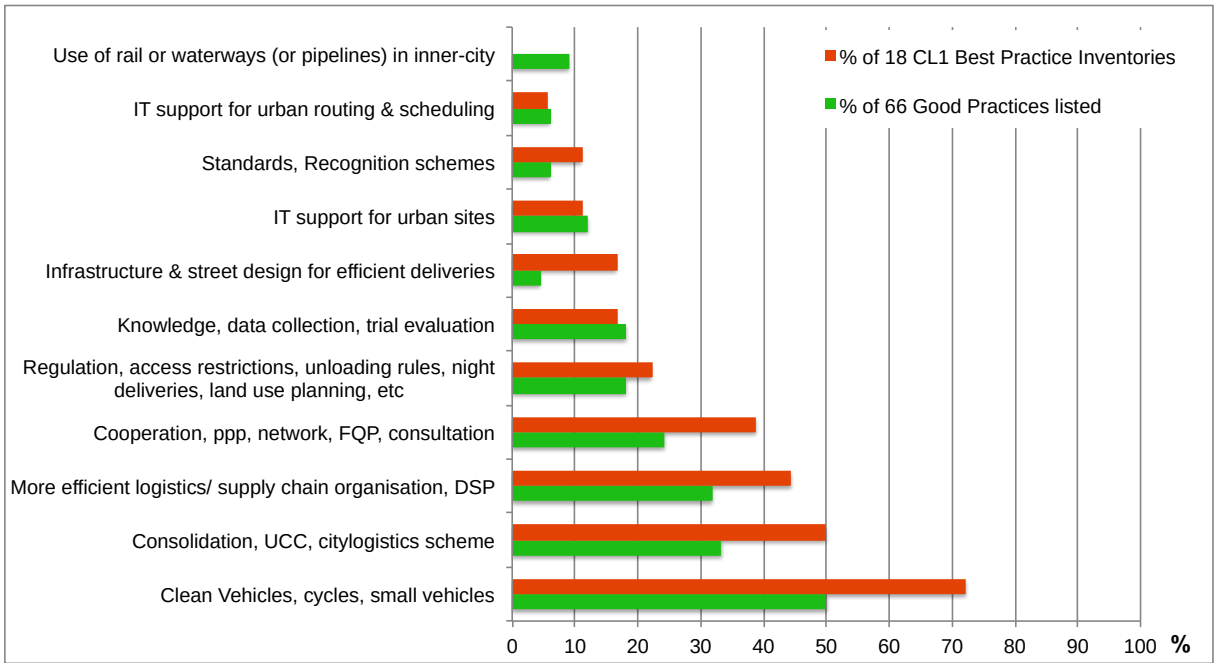
The most frequent type of activity are the low emission technologies, B2C and innovative operational solutions, followed by communication between businesses and authorities, access rules, innovative vehicles, consolidation centres, cooperation and regulation.

For 2013, we have developed a new Cluster 1 specific, slightly summarised typology in order to group the urban logistics activities into different categories. The figure below illustrates the number of actions performed in the cases. The main value is expressed as percentage of activities that are represented by the 18 Best Practice Inventories (section 2 above) and the 66 Good Practices listed by the partners (see list in annex 2).

In this report, more than 70% of the cases relates to clean vehicle use, and 50% to consolidation or City Logistics schemes that include the deployment of a UCC.

Not all Cluster 1 topics have been covered from the 18 inventories performed in 2013. Notably the use of waterways and rail, and the use of IT for routing and scheduling transport were missing. Since these two groups of activities are largely covered in Cluster 2 and Cluster 3, this gap was not considered crucial.

Figure 65: Types of activities occurring in 18 Cluster 1 Best Practice inventories, compared to those taking place within the 66 Good Practices listed, as % of total



4.2 Strategic targets covered

Table 6: Coverage of cases according to strategic targets

Targets supported by Cluster 1 cases	***Number of inventories***
Public sector	
Efficient public spending	3
Ideal utilisation of infrastructure	12
Competitive logistics and transport system	10
Acceptance and influence	8
Balanced provision of goods and services	2
Increased amenity value	3
Highest safety and security	5
Others: Attractive inner-city	3
Private sector	
Increased efficiency / productivity of logistics processes	16
Increased company profitability	6
Minimisation of financial risks	1
Increased competitiveness	6
Increased quality	8
Image	15
Increased safety and security	4
For both actor groups	
Limited climate change	12
Reduced emissions	16
Conservation of resources	5
Others? Reduced congestion	8

4.3 Regional coverage

Table 7: Coverage of cases according to regions and geographical entities

Geographical Coverage	**CL1** inventories
International	1
Europe	18
EU	18
Multi country (CL1_Lean&Green)	1
Northern Europe	3
Western Europe	5
Eastern Europe	1
Southern Europe	5
Central Europe	3

Table 8: Overview analysis of 18 Best Practice Cases for Urban Freight Transport in Europe, inventoried in 2013

Name	Main characteristics	Costs	Data availability	Impacts & benefits	Barriers	Transferability	Success factors
Binnenstad-service	UCC and clean vehicle scheme	Lower costs for operators	Congestion, emission	Low congestion & emissions	Acceptance of shops	Confirmed for 12 cities in NL	Good cooperation
Cityporto Padova	12 natural gas vans; UDC	Profitable since 2007	Well documented	Low pollution, traffic saving	Additional handling at UCC	Adopted by 5 cities in Italy	Access rules; good location
The Green Link	Electric vehicles and cycles	Not higher for clients. Profitable	Costs, benefits, emissions	Low traffic, noise and emissions	Private decision	High, confirmed	100% electric, forwarder decision
Gothenburg City Logistics	Electric vehicles, UCC & network	Expected to become profitable	Traffic, benefits, emissions	Traffic savings	Limited fleet size	To be confirmed	Good network of decision makers
Clean vehicles Donostia	Electric tricycles	Subventioned but small surplus 2012	Emissions, traffic and congestion	Traffic savings	Public decision	Given, transfer from La Petite Reine	100% electric vehicles
UPS Karlsruhe	6 electric vans	Not available	On emission reduction	Low noise and pollution	Private investment decision	High, confirmed	100% electric vehicles
La Petite Reine	Electric tricycles	No additional costs	Benefits, traffic, emissions	Low traffic, noise and emissions	Private decision to start the trial	Given but not confirmed yet	100% electric vehicles
Brescia clean vehicles	Clean vehicles and UCC	Not available	Ongoing data collection	Emissions and traffic	Public decision	Transfer from Padova	Access restrictions
Emakers	Electric tricycles	Not available	Ongoing data collection	Emissions, noise and traffic	Private decision	High, confirmed	100% electric vehicles
Copenhagen City Logistics	Electric vehicle and UCC	Not available	Traffic and emission reduction	Low pollution, traffic saving	Additional handling at UCC	To be confirmed	Clean vehicles
Marleenkookt meal deliveries	Electric cycles	Not available	Ongoing data collection	Emissions and traffic saving	Small scale	To be confirmed	User friendly
Citylog EMF	Electric road train vehicles	Not available	Ongoing data collection	Emissions and noise reduction	Prototype trials to be confirmed	To be confirmed	High capacity, modular system, high safety
GOFER traffic management	Traffic management for freight	Not available	Traffic, speed	Traffic savings	Demonstration, to be confirmed	To be confirmed	Avoid congestion and increase average speed
EMEL loading bay management	Loading bay availability sensor & IT	Not available	Traffic, emissions	Traffic savings	Public investment	To be confirmed	User friendly
FORS	Recognition scheme for operators	About £100K/year	Costs, benefits, emissions	Low emissions, less accidents	Public sector investment	Given	Public tenders for FORS bronze members
Lean and Green	Award for cities	Not available	Emission reduction	Traffic and emission saving	Public decisions	Given	High acceptance
Lithuanian Postbox	Decentral location; 24 hours availability	Lower costs	Traffic, benefits, emissions	Traffic savings	Private investment decision	To be confirmed	New IT support
Postbox Austria	Decentral location; 24 hours availability	Not available	Traffic, benefits, emissions	Traffic savings	Investment decision	Transferred case	High acceptance

Source: Section 2 Inventories and in-depth reviews, see above

5 Transversal analysis

5.1 Reaching the target of integrating business and public sector interests

The report provides systematic information and a structure to better understand why each solution is an innovation that is technically feasible and economically profitable in different contexts, while at the same time makes sure that it is a sustainable solution with a tangible beneficial impact. The main public benefit is the contribution to reduce the negative externalities of transport, a question that is at the core of local policies and public sector interests. The study also informs decision makers about barriers and limitations that would need to be taken into account when one would try to reproduce the same solution in a different context. It identifies certain conditions that might be necessary to be put in place if the solution should lead to a success story.

5.2 Overcome the barriers for implementation

In the cases presented above, most of the barriers that needed to be overcome have to do with information and cooperation, with investments and with decision-making. In order to become successful solutions, there is however little evidence that a typical model exists that would enable to overcome all existing barriers. Probably the most cited problem solving approach is the dialogue between city authority and multiple stakeholders, integrated together with a good preparation of public support for private initiatives (Holguin-Veras et al. 2005). But even if this is a successful approach when dealing for example with the implementation of a new urban distribution centre, this seems not appropriate when dealing with routing software or with a cooperation among supermarket chains. Therefore, it is appropriate to search for solutions to overcome barriers for the implementation of these beneficial solutions. Further solutions to overcome the barriers are: Make the benefits become visible to a broad public; decide with a clearer understanding of costs; be aware of the replicable dimension of the success stories. These solutions will be explained below.

5.3 Make the benefits visible to a broad audience

The positive impacts are one of the key reasons why the solutions have been developed in the first instance.

The results show a medium level of detail on what are the benefits that could arise from a combination of Urban Distribution Centre and clean vehicles in Padova and in the Netherland cities with Binnenstadservice. The benefits from the use of clean vehicles for The Green Link and the Donostia case are demonstrated. The City Logistics concept and combination of initiatives in Gothenburg is also beneficial for both public and private sector. The level of detail of the in-depth reviews should be enough to allow decision makers to replicate these trials in their cities or in their businesses.

To make the benefits visible to a broad audience promotes a good practice and tends to increase its transferability.

5.4 Decide based on a clearer understanding of costs

Experimentations show that if costs are affordable for the customers and profitable for the operator, this increases the chance of success. At the same time, together with the analysis of transferability, the cost analysis of freight trials is a point where the understanding is the least developed. A prototype, or a solution tested at a very small scale, is always expensive, when looking at the costs per item delivered in the starting phase. The start investment is a big economic hurdle, and the question is to take it or not take it into account when calculating the long-term costs that will be on the market when the solution becomes viable.

Not every trial is designed to demonstrate the economic viability. Most cases are designed to showcase the technical feasibility of a solution, and eventually tangible, beneficial impacts.

However, if confronted with the question of extending the trial in case of success, the question of costs is crucial and the absence of real cost data means that decisions are taken on the basis of theoretical assumptions, which is risky. Cost-benefit data obtained with a trial under real market conditions are beneficial for the future transfer of Best Practice solutions.

Ideally, beside managerial tools such as cost-benefits analysis or Net Present Value calculations, the cost dimensions would be calculated together with freight data such as costs per item delivered, for the client, or in costs per km driven, for the variable costs, and/or in total costs per vehicle per year, for the operator perspective. This type of information could be collected for the in-depth survey of The Green Link and Donostia San Sebastian, but it remains an exception.

These costs would need to be compared in a before-after analysis with the situation before the solution was implemented, so the economic impact for the business and the profitability of the solution become visible. So far, even for the best information level, such a before-after cost-benefit analysis has not been implemented.

5.5 Be aware of the replicable dimension of the success stories

The first part of the analysis of transferability is not to look at already implemented transfers, but to analyse how the case observed demonstrates in itself its potential replicability. If for example the company that initiates a new solution invests a lot of effort and finance into a new project, and claims that it has become self-sustaining after a short period of time, this seems to suggest that the solution could be easily replicable.

However, to be more certain, the conditions need to be looked at more in detail: Questions to be asked in this context are: what is the size of the business? Is it a typical case for a general cargo operator, or is it a much specialised market? Further questions are needed to understand under which conditions the success story can be replicated with similar chances of succeeding in achieving its targets.

6 Concluding report

6.1 Coverage of cluster topics

Many solutions are available that demonstrate both a high innovation and a high technological or economic feasibility. There is a dominance of clean vehicle and consolidation projects in the perspective of the experts, so that out of 18 projects inventoried in 2013, 14 were on clean vehicles and 9 on urban consolidation centres. All in-depth surveys were on clean vehicles and consolidation, because there is a strong need of expert exchange on this.

Other topics such as use of postboxes and lockerbanks, recognition scheme, cooperation and networking, and use of IT systems, also demonstrated interesting technical or managerial innovations, and in this sense the trials have shown under real market conditions that the solutions are applicable.

6.2 Conclusions

One of the key questions that remains to be answered are the growth conditions and potential for future growth of clean vehicles and consolidation centres on the market. To this aim, a dedicated Workshop has been prepared for January 2014, and the main CL1 in-depth surveys projects will be represented at this event.

Very few cases demonstrate a large-scale transfer, and the solutions are mostly limited to another company, an upscale within a company or a limited transfer to another city. Therefore it is further needed to assess this particular question in the next year.

High qualitative benefits for the public sector and profitability for businesses were demonstrated in most of the cases. This shows strength of the 2013 Best Practices.

Biggest difficulty is the collection of quantifiable data, especially for the before-after comparison. Data collection in urban freight remains a challenging task. One of the main future tasks will be to obtain data on a successfully transferred case and on a success in terms of growth and upscale from a small-scale trial to an industry wide solution.

The success factors are helpful for practical decision-making. Cooperation is very often mentioned a key, a contract with a large business being the most crucial factor for young starting businesses.

ANNEX

ANNEX 1: List of 66 cases pre-assessed in 2013 in Cluster 1

BESTFACT ID number	Short Name	Summary Description of Best Practice Case
CL1_072	EMEL loading and unloading regulation in Lisbon	Loading / unloading operations management and regulations in Lisbon (Portugal), including hardware and IT support system for loading bay control.
CL1_093	Saraloc	Online access management tool for construction site deliveries. Supporting planning and efficient usage of access rights, equipment and space for supply and demand side on sites for major construction works. Problem: confidentiality and missing quantifiable results, but high level of success.
CL1_094	Railcare city logistics Geneva	Following the success of railcare case (2012) operations on longer distances, a shuttle train is employed for 60km to travel between lausanne and geneva for supply of supermarkets in geneva. The rail operator also organises the distribution with trucks which avoid severe congestion levels
CL1_095	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.
CL1_096	Modal split conditions for freight intensive facilities	Definition of modal split conditions (share of rail transport) for facilities with a high freight intensity
CL1_097	LP Express24	Urban postal distribution with locker banks.
CL1_098	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)
CL1_099	Kautra parcel public boxes system	Parcel and small cargo delivery using interurban bus system
CL1_100	Assorti retailer	Delivery to door of households service network (assorti retailer of goods customized for children, babies and their baby sitting-parents).
CL1_101	Optrak application for wholesale freight	Application of a new routing and loading system for road freight transport of pallets (now a cluster 3 case)
CL1_102	Citylog emf	Citylog emf (efficient, modular, flexibel) – electro-multifunction-transportation vehicle
CL1_103	Post empfangsbox (post receivers box)	Post receivers box is installed directly in houses and offers the possibility to drop boxes instead of having multi-trial-deliveries
CL1_104	La Petite Reine	Delivery with cargocycles in inner-cities in france
CL1_105	Cityporto Padova	City logistics cooperative system in padova - now to be extended to parcel and perishable goods delivery
CL1_106	Niewmarkt consolidation	Urban distribution in Amsterdam nieuwmarkt by consolidation of freight (expectation of a 10 % reduction of the number of trucks).

CL1_107	Lean and Green award for cities	This is a process to help cities become more "green" with respect ot urban distribution.
CL1_108	Binnenstadservice nederland	Goods are delivered at a distribution centre just outside the city. From there the goods are brought to the shops. Simultaneously empties/packaging/paper is taken back to the distribution centre.
CL1_109	Last mile distribution with electric vehicles - Rome (italy)	Business case on last mile distribution with electric vehicles and the use of a transit-point, as a demonstration of a public-private collaborative approach to urban freight distribution.
CL1_110	Project civitas-elan: sustainable freight logistics	Web-portal supporting and promoting sustainable city logistics incorporating online routing tools for goods deliveries in Ljubljana city centre
CL1_111	City logistics in Copenhagen	Copenhagen city logistics development project finds ways to reduce delivery truck traffic in the city area.
CL1_112	Nihub	The nordic sustainable intelligent truck hub aims to develop an innovative way to reduce heavy truck traffic in urban areas. The main idea is to find and utilize synergies of last mile deliveries
CL1_113	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.
CL1_114	Ecostars Rotterdam	Recognition scheme. Ecostars europe strategic objectives is 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.
CL1_115	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).
CL1_116	Emilia-Romagna region electromobility and urban freight policies	Updates in electromobility and urban freight policies
CL1_117	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."
CL1_118	Clean freight demonstration in Newcastle	Collaborative approaches for urban interurban shipment planning, use of hybrid electric vehicle and a new consolidation centre within smarfusion (2013-2014) in newcastle

CL1_119	TNT mobile depot straightsol	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.
CL1_120	Straightsol multi-actor, multi-criteria analysis (brussels' case)	Stakeholder-oriented tool to evaluate transport projects
CL1_121	Ecopostale	Parcels distribution with electric bikes and vehicles
CL1_122	Freight plan and different actions included in this dsp, waterway	Brussels region urban freight plan is launched end 2012.
CL1_123	Smartfusion, dmf process Berlin	Understand and identify urban freight stakeholders needs and commitments to improve their last mile urban freight
CL1_124	Area protection for new logistics settlement	Freight depot Berlin-Tempelhof
CL1_125	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.
CL1_126	Electric trucks for waste collection	As part of the e-mobility/co2 reduction policy of the city of Rotterdam
CL1_127	Ecostars Edinburgh	Recognition scheme applied in Edinburgh. See CL1_114
CL1_128	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. Automatic data capturing and information sharing will make it possible to harmonize the urban transport to achieve environmental and economic benefits.
CL1_129	Trucksafe	Safety charter and label for safer road transport
CL1_130	Citymodel	Innovative logistics model for goods distribution in urban centers
CL1_131	Edrul	Innovative IT platform and of support services, in order to improve the management of cargo distribution and logistic processes in an urban environment. Firmly based on integration with e-commerce and e-business concepts and architectures.
CL1_132	Civitas-archimedes (san sebastian)	Feasibility study into freight consolidation, including: introduction of a freight consolidation centre and use of telematics to improve communication between shopkeepers and transport companies.

CL1_133	Pipenet	Pipe§net is an innovative freight transport system. It is constituted by a net of special pipes and other devices which will allow an high speed and low energy freight transport.
CL1_134	C-dispatch	Sustainable business model for increasing the efficiency of door-to-door goods transport in the urban area of Frosinone.
CL1_135	Luslin	Implement and test innovative eco-friendly city logistics services in Lucca.
CL1_136	Civitas-caravel (burgos)	More environmentally friendly goods delivery by limiting access to clean zones in the city centre and using cleaner vehicles.
CL1_137	Merope	Pilot demonstration of web-based load zone reservation
CL1_138	European central bank Darmstadt	restructuring of the former central market area: construction site logistics
CL1_139	Ups electric van use in Karlsruhe	Use of electric vehicles for parcel distribution at ups Karlsruhe. Exchange of conventional steering engines by electric ones at ups Karlsruhe
CL1_140	Ups swap-bodies	Ups inner-city deliveries with swap-bodies in Hamburg
CL1_141	Evito	Electric vehicle use at dhl stuttgart/ludwigsburg - field test of combined delivery of parcels and mail by use of evito
CL1_142	Berlin field tests	Commercial transport activities berlin - quite different activities and field tests are ongoing or planned
CL1_143	Urban distribution in Utrecht	Done with the "beer boat"(an electric, zero emission boat), cargohopper (electric delivery vehicle) and other solutions
CL1_144	Parcycle project	Dhl adds another 7 city centres to parcycle project - distribution of parcels with light weight cargo bikes
CL1_145	Mokum mariteam	Waterways use solution that is similar to zero emission boat
CL1_146	Fietsexpress	Package deliveries with bicycles
CL1_147	Dhl bicycle deliveries	Dhl bicycle deliveries in 10 dutch cities
CL1_148	Centrumservice	Similar to fietsexpress
CL1_149	Green city Amsterdam	Green city distribution in Amsterdam: urban distribution with electric, natural gas or biodiesel
CL1_150	020-stadsdistributie	Fresh, cool and frozen urban distribution of goods with clean vehicles
CL1_151	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 enables better load factors for its fleet, lowering the fuel costs and other costs per load unit.
CL1_152	Eco-logis Brescia	City logistics cooperative system in Brescia - now to be extended to parcel and perishable goods delivery. A succesfull transfer of bp from cityporto padova.

CL1_153	FORS	Freight operator recognition scheme in London
CL1_154	The Green Link	Parcel service distribution with electric vehicles in Paris
CL1_155	Marleenkookt meal deliveries in Amsterdam	Marleenkookt meal deliveries in Amsterdam
CL1_156	Donostia bike freight	Urban freight distribution with clean vehicles in San Sebastian Donostia
CL1_157	Gothenburg	Gothenburg City Logistics Initiatives
CL1_158	Emakers	Emakers urban freight delivery solution with clean vehicles

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