BESTFACT

Best Practice Factory for Freight Transport

Internal Report Cluster 1 2014

IRCL1.3

Urban Freight

Innovations and solutions for sustainable deliveries

FINAL

Date 9 June 2015

Project co-funded by the European Commission within the Seventh Framework Programme
Start date of project: 1st January 2012 **Duration: 48 months**

Dissemination Level		
PU	Public	
PP	Restricted to other programme participants (including the Commission Services)	X
RE	Restricted to a group specified by the consortium (including the Commission Services)	
CO	Confidential, only for members of the consortium (including the Commission Services)	

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Disclaimer

Abstract

This document presents the long version of the material collection on the BESTFACT Urban Freight Best Practices 2014. It uses the selection and evaluation methodology developed by the BESTFACT team. It includes 11 case studies presented in form of standardised inventories and 6 in-depth surveys.

Document versions

Version number	*Name (company)*	*Date*	*File name*
1	*Jacques Leonardi (UoW)*	*21 Nov 2014*	BESTFACT_IRCL13-ClusterReport2014-21Nov2014.doc
2	*Jacques Leonardi, Michael Browne (UoW)*	*17 Dec 2014*	BESTFACT_IRCL13-ClusterReport2014-17Dec2014.doc
3 (after EC review)	*Jacques Leonardi (UoW)*	*9 June 2015*	BESTFACT_IRCL13-ClusterReport2014-9June2015.doc

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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
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)
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
RFID	Radio-frequency identification
ROI	Return on Investment
UCC	Urban Consolidation Centre
UDC	Urban Distribution Centre

1 Summary of the Urban Freight cases 2014

1.1 List of BESTFACT Cluster 1 Best Practice cases 2014

1. La Petite Reine: Supermarket Home Delivery Services by e-bikes
2. Beaugrenelle UCC of Chronopost, by Sogaris
3. Smart Urban Logistics: an Austrian networking platform to boost and promote intelligent solutions in the field of urban logistics
4. EMILIA electric mobility
5. LOGeco ? eco-friendly logistics: innovative approach to public-private decision making process
6. Electric Removal Truck, Aad de Wit Verhuizingen
7. Combipakt: delivery services via taxi
8. Mokum Mariteam: Cargo delivery by a 20 meter long full-electric ship on the canals of Amsterdam.
9. Citylogistik-kbh Copenhagen UCC
10. Kautra: Parcels distribution services by bus
11. Meyer&Meyer: Use of heavy electric trucks for urban distribution

1.2 Summary of Urban Freight Best Practice cases 2014

1.2.1 La Petite Reine: Supermarket Home Delivery Services by e-bikes

'La Petite Reine' delivers purchases from supermarket 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.

1.2.2 Beaugrenelle UCC of Chronopost, by Sogaris

Beaugrenelle ULC is a logistic centre located in the centre of Paris, close to Chronopost's customers. It has as main impacts the reduction of delivery distances (vehicle km should be divided by two) and CO2 (predicted reduction of about 80%) and the improvement of the express service. The automation of the whole operation on the site decreases the difficulty of the work and improves safety.

1.2.3 Smart Urban Logistics: an Austrian networking platform to boost and promote intelligent solutions in the field of urban logistics

The aim of the initiative "Smart Urban Logistics" is to build up an Austrian networking platform to boost and promote intelligent solutions in the field of urban logistics.

The intention was to make stakeholders aware of the topic, to create acceptance for innovative technologies, to initiate a communication process, to support further discussions and to be the incentive for the start of pilot projects that help to design future cities.

1.2.4 EMILIA electric mobility

The demonstration project focuses on innovative freight logistics for urban areas especially tailored towards a significant use of electric mobility ranging from e-cargo bikes to alternatively-fuelled road trains:

- *Open Innovation for actively involving external stakeholders*
- *Develop novel logistics concepts, algorithms and applications*
- *Optimize small cargo vehicles: increasing range and reducing cost and weight*

• Demonstrate that using electric vehicles in urban logistics is technically feasible and economically viable

1.2.5 LOGeco ? eco-friendly logistics: innovative approach to public-private decision making process

The LOGeco project deals with design and validation of a new model for urban logistics solutions that entails innovative and sustainable actions. LOGeco started for example a new management process for City Logistics policy in Rome Trident, set-up an Urban Consolidation Centre, increased the use of clean vehicles, contributed to change in regulation and access rules to certain area, and to increase in logistics operation efficiency. LOGeco involves all the relevant public and private stakeholders operating in the different distribution chains affecting the urban freight sector, and defines sustainable solutions for the 'last mile', including electromobility.

1.2.6 Electric Removal Truck, Aad de Wit Verhuizingen

Aad de Wit now uses two full electric trucks for removals. Hereby, the company fulfils current and coming environmental rules and regulations implemented in Amsterdam. The company now offers a zero-emission furniture removal service in the city, but in fact they can offer it country-wide. The electricity used by the trucks is 100% green energy (solar and wind energy). Besides, the trucks are more silent compared to conventional removal trucks. Removals by Aad de Wit can be done in a clean and quiet manner.

1.2.7 Mokum Mariteam: Cargo delivery by a 20 meter long full-electric ship on the canals of Amsterdam.

Mokum Mariteam uses the canals of Amsterdam to transport goods and deliver services. Hereby it reduces the number of small- and medium-sized trucks in the inner-city. The ships are driven by silent and clean electric engines. Goods are transported through the city and delivered at its destination without noise pollution. Using existing transport units like rolling containers, pallets and mesh containers, the system can be implemented by new clients and partners without any problems. This makes it possible to scale up the system gradually.

1.2.8 Combipakt: delivery services via taxi

A taxi company for special target groups and patient transport and a traffic school delivers medicines from the city of Nijmegen to rural villages and houses in the surroundings of the city. On their way back to Nijmegen they pick up agricultural products from small farms and bring these to the city. Both the taxi company and the traffic school do this together with their usual business. This reduces the number of cars/vans in the city of Nijmegen as well as it increases the level of services in rural areas. At the same time a 100% transition from conventional fuelled vehicles to electric vehicles takes place.

1.2.9 Citylogistik-kbh Copenhagen UCC

Citylogistik-kbh 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 that are participating to the scheme.

1.2.10 KAUTRA: Parcels distribution services by bus

Purpose of the service is to deliver parcels and small cargo from any KAUTRA served city or town to another city or town that is also served by KAUTRA interurban busses in no more than 24 hours. Parcel and small cargo is delivered using interurban buses. The most of the parcels and cargo are delivered the same day or it takes as long as it takes for the bus to go between origin and destination. Par-cels and small cargo may be dropped off in designated terminals or directly to the driver of the bus if there is no terminal in the city.

1.2.11 Meyer&Meyer: Use of heavy electric trucks for urban distribution

To increase their corporate image, test the usage of electro mobility and develop concepts to increase the profitability of electro trucks, the logistics business Meyer&Meyer, specialised in clothing, started a pilot in which the C&A store (Kurfürstendamm) is being delivered by an electric vehicle. For this purpose they developed a vehicle concept for 12t MAN trucks in cooperation with the manufacturer All Green Vehicles (AGV, The Netherlands) where existing standard diesel-powered vehicles are modified with an electric engine.

1.3 Summary of the Urban Freight cases 2013

1.3.1 Binnenstadservice Nederland

Binnenstadservice Nederland is an innovative concept that has been applied for five years in 11 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.

1.3.2 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).

1.3.3 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.

1.3.4 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.

1.3.5 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.

1.3.6 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 particulate 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.

1.3.7 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.

1.3.8 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.

1.3.9 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.

1.3.10 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.

1.3.11 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.

1.3.12 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.

1.3.13 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).*

1.3.14 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 demon-

stration 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.

1.3.15 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.

1.3.16 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.

1.3.17 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.

1.3.18 Post Receiving Box by Austrian Post AG

The "receiving box" allows the deposit of registered mail at the customer's residence. If a shipment cannot 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.

1.4 Summary of the Urban Freight cases 2012

1.4.1 Use of battery-electric tricycles and vans for retail distribution in London: Gnewt Cargo

Electrically-assisted cargo tricycles and electric vans are used to deliver parcels from a small urban consolidation centre to customers in the centre of London. The operation of the vehicles does not result in any fossil fuel consumption or greenhouse gas emissions as the electricity used is produced from renewable sources. The urban consolidation centre and the deliveries made from it are operated by the new company Gnewt Cargo, specialising in green urban freight deliveries.

1.4.2 Electric vehicles use in parcels deliveries in Stuttgart-Ludwigsburg

As part of the IKONE project, about 50 Mercedes-Benz Vito E-CELL transporters powered by electricity are used by selected partners and the large German parcel logistics service provider DPD in the Stuttgart region. Their field of application involves various commercial activities and delivery tasks. The Stuttgart region has a very difficult topography (situated in a basin) and the filed test focused on the analysis of the vehicle use in these specific conditions.

1.4.3 Distripolis: Urban Consolidation Centres and battery-electric vehicles for last-mile deliveries

In order to replace the use of standard diesel trucks, GEODIS, a large road transport operator, is testing Urban Consolidation Centres (UCCs) and electric vehicles in a large scale trial in France. In the project (called Distripolis) new, small UCCs (blue points in the picture to the left), are located in the city centre of Paris, and receive goods from a central depot (located in Bercy) by Euro 5, Hybrid or CNG trucks. From these UCCs, the final deliveries are performed with low emission vehicles (battery powered - electric vans and tricycles) on short distance trips.

1.4.4 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 m2. 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). The deliveries are performed by 11 LNG-powered vans. The depot is a 1000 m2 wide urban consolidation platform located within the freight village.

1.4.5 Electric freight vehicle with trailers: Cargohopper in Utrecht

Cargohopper is a dedicated inner city delivery service using clean freight vehicles in Utrecht, Netherlands. The service was introduced in 1996 in order to efficiently perform last mile operations for local businesses, especially for tourist venues, restaurants and catering facilities. Currently, an electric powered road train is running on the streets of Utrecht for parcels deliveries using the Cargohopper name. Other innovative vehicles are also used or under development as part of Cargohopper.

1.4.6 Binnenstadservice Nederland

Binnenstadservice Nederland is an innovative concept that has been applied for five years in 11 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 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.

1.4.7 Berlin tests of BentoBox in the Laboratory area

The urban freight 'laboratory area' is a small residential and mixed-use business and retail area in a central borough of Berlin, Germany, in which innovative freight transport solutions are tested, studied and presented. The Bentobox technology consists of the use of a new locker bank for parcels storage, and of electrically assisted bikes for final delivery. Bentobox tests were performed in the laboratory area. The project leader, the Senate Department for Urban Development and Environment of Berlin, seeks to use this area for further tests, including e-mobility and smart freight solutions.

1.4.8 ILOS - Intelligent Freight Logistics in Urban Areas, Vienna

The objective of ILOS is the development and definition of indicators to describe the saving potential of transport journeys in urban areas using traffic information obtained through floating car data, as well as the development of appropriate quantification methods to determine these indicators from route analyses in order to achieve a possible saving potential in terms of time or distance. This in turn leads to savings in fuel, emissions and operating costs.

1.4.9 iLadezonen in Vienna, Austria

The project i-Ladezone focuses on two major topics. The first is the development of management methods in order to open delivery opportunities through the efficient and effective monitoring of the occupancy of loading bays by loading vehicles and private cars. The second topic focuses on the development of a management system for keeping the loading bays at maximum availability and reducing impacts on traffic caused by the loading activities. Also included is the development is an intelligent routing application for mobile use by the drivers of the goods vehicles.

1.4.10 Multiuse lanes for freight distribution in Bilbao

'Multiuse lanes' is one of the initiatives developed in Bilbao by the local authority and local stakeholders to improve goods distribution in the city. This initiative consists of the more efficient use of lanes in the city centre streets. In this approach, one of the road lanes will be provided for the loading and unloading of goods at certain time slots, and used for other vehicle activities during the rest of the day.

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

At the Exhibition Centre of Basel, the largest in Switzerland, the operator MCH Messe Basel introduced a new logistics booking system. Exhibitors, stand builders and other suppliers have to register in advance via a designated online logistics tool for all deliveries and pick-ups to the venues. All logistic processes are managed and handled by the trade fair's logistics operator. This logistics tools offers a solution for the specific problem of the Messe Basel Exhibition Centre, but is highly transferable to many urban facilities or logistics intensive campuses elsewhere.

1.4.12 Network of four Urban Retail Distribution systems in Lithuania

A market dominance (oligopoly) of a few retail supermarkets in Lithuania has led to an optimised urban logistics solution: four chains operate most of the supermarkets across the country, from small to large scale stores, which are located in every town and city. All these supermarkets are serviced from strategically located logistics centres, at which goods are loaded as consolidated shipments onto large vehicles, thus reducing the number of trips made to supply each shop and by using optimised routes. The number of vehicles and trips are reduced, leading to a positive impact on traffic & emissions.

1.4.13 Optimisation of waste collection in Maribor

For waste collection rounds in the city of Maribor, Slovenia, a new route optimisation solution has led to savings of 20% in time spent and distance covered by the fleet. The route optimisation makes use of an operational research algorithm that solves the so-called "Chinese postman problem". This algorithm was used by SNAGA, the main urban waste management company. The optimisation is based on high quality data, GIS use and detailed knowledge of day-to-day operations. The solution resulted in more optimal vehicle routes and savings that are beneficial for the public sector.

1.4.14 Zero emission Beer Boat in Utrecht

The beer boat concept was introduced in the city of Utrecht in 1996 in order to perform efficient last mile operations in the delivery of beer to catering and drinking establishments, thereby preserving the historical centre of the city, relieving the pressure on road traffic and complying to labour laws (for carrying barrels and crates). In 2010, the City of Utrecht updated the beer boat with an environmentally-friendly electric boat. Building on its success, in 2012 the City introduced another zero-emission boat for use in carrying other products including waste.

1.4.15 Franprix en Seine: Shop deliveries using waterways in Paris

Franprix supermarket stores in Paris are being supplied through a new multi-modal and urban transport chain solution. In this innovation, the last transport leg between regional distribution centre and retail shop occurs via waterways. The shipment is transported in a special container, sent from the warehouse to a river port in the periphery by truck, then by barge to the centre of Paris, shipped on the Seine River for a distance of 20 km to the Quai de la Bourdonnais in central Paris. From there another truck transports the containers to the shop on a very short trip.

2 Introduction of Cluster 1 Urban Freight

2.1 Introduction

The objective of Cluster 1 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.

The 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 that lead to reductions in 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).

After providing and overview of all Best Practice Cases (section 1), and a short thematic introduction and analysis (Section 2), one of the key objectives of this report is to provide an observation and inventory of 11 promising measures evaluated by the end of 2014 (section 3). In this report, 6 of these initial cases and results are presented with a more advanced level of detail – the so called in-depth reviews - illustrating the application of the methodological innovations (section 4). This report ends with a transversal analysis of the solutions observed. At the end, preliminary conclusions and lessons learnt are drawn (section 5).

2.2 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. As in other business sectors, the technology innovation cycle in freight transport and logistics typically 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.

One of the major novelty in Urban Freight in 2014 is that running operations with full-electric vans <3.5t is no longer producing a commercial deficit. Many businesses have reported an even situation on the vehicle costs compared to diesel vans. This cost reduction is valid for small delivery vehicles up to 3.5t GVW. For larger vehicles and trucks, however, the costs of purchasing a full electric solution remain prohibitive.

The key practical output of this report is to give decision makers a detailed knowledge base of success stories and a better understanding about why one solution may be 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 is put on transferability criteria and on costs and benefits for public and private sector initiatives.

2.3 Cluster topics

The following overview presents all eleven 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. Like in the years 2012 and 2013, the report of 2014 shows that is difficult to demonstrate some costing issues. Notably missing in most cases is how the solution can contribute to lower the private costs of customers and improve the profitability of the logistics services using the innovation.

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 financial balance is beneficial for the running organisation.

On transferability, which seems to be even 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.

2.4 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 between 2012 and 2014, including meetings and workshops, case studies and inventories collected and interviews with operators:

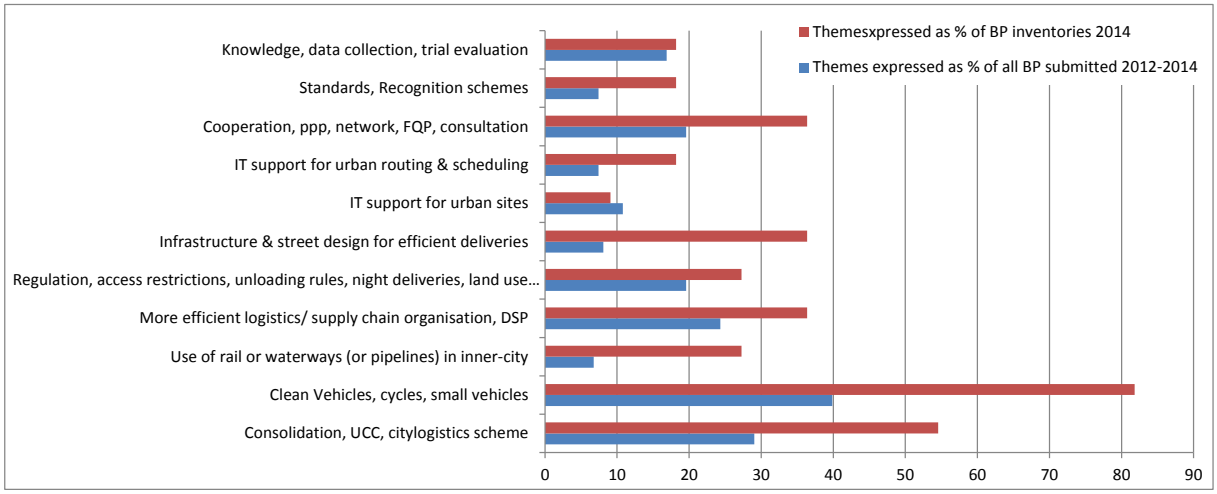
- High costs of electric trucks
- Benefits are difficult to quantify
- Diesel fuel technology and infrastructure is dominating the market
- Technical difficulties in running alternative fuelled vehicles
- Cooperation for shared use of consolidation centres is difficult
- Lack of IT use for many small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

2.5 Overview of inventory themes

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 2014 (Figure 1). Other main topics of interventions are efficiency, cooperation, regulation and access restrictions, and data collection.

Figure 1 presents an overview of type of activities, expressed as total number of listed Good Practice initiatives within 11 inventories and submitted cases in 2014, compared to the type of activities of all 148 initiatives listed.

Figure 1: Typology of Best Practices in 2014, thematically grouped



The two major tendencies observed in previous BESTFACT years are therefore confirmed.

1. All topics are represented.
2. There is a clear trend towards clean vehicle and consolidation centre projects.

Entirely new this year is the activity of testing heavy full-electric trucks. All other types of activity were already mentioned in previous years.

3 Inventory formats

3.1 La Petite Reine: Supermarket Home Delivery Services by e-bikes

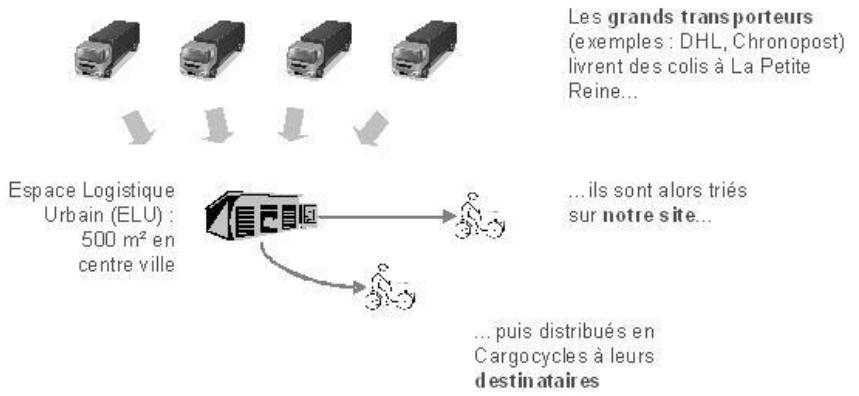
Basic information	
1.1) Identification CL1_052	La Petite Reine : Supermarket Home Delivery Services by e-bikes
1.2) Cluster	CL1 (Urban logistics)
1.3) Responsible authors/	Christophe Rizet (IFSTTAR)
Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Retail, freight operator, last mile delivery.
2.3) Geographical Area	4 French cities: Bordeaux, Lyon, Paris and Toulouse
2.4a) Type of city	☒ Large: >1 million inhabitants ☒ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	To what extent 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)…
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, usually 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	Not available for this case. It is assumed that the business is profitable after some years of delivery activity.
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.
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
	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. Exact data on the transfer of this solution are not available.

4.5) Similar cases	Many other cycle freight projects and electric vehicle projects for retail deliveries in Europe, for example Txita in San Sebastian, Markenkloot in The Netherlands, and worldwide.
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	February 2014
5.5) Pictures	**Figure 2: Electrically assisted tricycles manufactured by La Petite Reine**  **Figure 3: Cargocycles at the underground parking depot of La Petite Reine in Paris** 

	Figure 4: 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 running electric tricycles for its operations in French cities.
5.7) Impact on SME	Further growth prospects of this type of solution are high.
5.8) Opportunities for SMES	SMEs could start similar businesses in other cities and countries.

3.2 Beaugrenelle Urban Logistics Centre

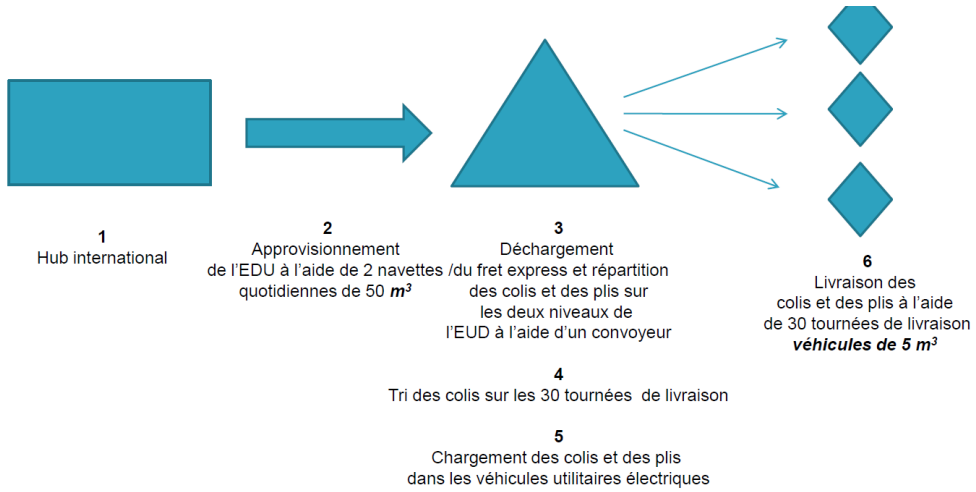
Basic information	
1.1) Identification	**Beaugrenelle (Paris 15ème) Urban Logistics Centre**
1.2) Cluster	CL1 : Urban Freight
1.3) Responsible authors	Christophe Rizet (Ifsttar)
Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	Which branches of industry, which type of authority or what other type of actor groups are involved? Name all possible. Chronopost is a specialist of express delivery of mails and parcel up to 30 kg, to companies and private individuals, towards the national and international destinations.. Sogaris, a semipublic company specialized in the design and the management of urban multimodal logistic platforms and urban logistic real estate SemPariSeine a semipublic company of the City of Paris, planner, builder and administrator of works for local authorities

	Enercop, producer of 100 % renewable energy
2.3) Geographical Area	From which country (and city) does the practice originate? France, Paris
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. Evolving Best Practice ☒ Best Practice
	Started in 2013 the UCC in city centre of Paris is a very new development. However, Sogaris has good experiences regarding the design of UCC and Chronopost regarding their operation, since the previous UCC of Concorde, in another central Paris borough, but of much smaller size, is in place since 2005.
2.5) Date of implementation	April 2013
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 …
2.9) Supply chain elements	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 ☐ 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)…
Best practice	
3.1) Description of the practice	Beaugrenelle ULC is a logistic centre located in the centre of Paris, close to Chronopost's customers. It will have as main impacts the reduction of delivery distances (vehicle km should be divided by two) and CO_2 (predicted reduction of about 80%) and the improvement of the express service. The automation of the whole operation on the site should decrease of the difficulty of the work and improve safety.
3.2) Technical main characteristics	Located in Paris 15th Arrondissement, close to the river Seine and a large Shopping Centre, the UCC is a new depot with a surface of 3027 m_2 on two levels. It is intended to use 30 electric freight vehicles and to deliver parcels of less than 30kg

	weight via the operator Chronopost. Chronopost is a French subsidiary of La Poste, the historical French postal distribution service. The Beaugrenelle UDC is supplied from the international hub of Chilly-mazarin (located 20km south of Paris) by means of 2 daily shuttles of 50 m3 lorries, arriving at night during off-peak times. In Beaugrenelle, parcels and folds are unloaded on both levels of the UDC by means of a conveyor belt. Parcels are sorted and then loaded in electric commercial vehicles for 30 delivery tours. The vehicles used for deliveries are Goupil (5 m3), MUS-ES, Renault Kangoo, and Chronocity, a kind of mini container moved on an electric pallet truck.
3.3) Success factors	Beaugrenelle UDC has been designed to suit perfectly into the surrounding districts, respect the last standards of safety and environment and to create a new activity at the heart of Paris.
3.4) Main benefits	What are the main benefits of the practice? • Benefits in the field of services? The UDC is close to the delivery addresses • Benefits for the society? Less kilometres in the city : On the medium term, the km should be divided by two, according to the operator Chronopost • Number of km travelled • Environmental benefits, expressed in CO_2 or CO_2equivalent? This is achieve with the use of electric vehicles for the last mile. Chronopost hopes that this UDC will allow a reduction of about 80 % of the CO_2. • Other signs/indicators of success? The automation of the whole operation of the UDC will allow a decrease of the difficulty of the work and more safety and security.
3.5) Cost indication	Not available, but profitability is given for both real estate business Sogaris and logistics business Chronopost.
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed? The main limitation for this type of project is the availability and cost of land : there are high real estate prices in the centre of a large city.
3.7) Common practice before implementation	Postal depot was used 20km away from city of Paris.
3.8) Motivation/problem	Lack of logistics space in central Paris.
3.9) Justification of practice	Innovative because of bringing back logistics facilities to the city centres and feasible because it works on daily business basis Business objective of profitability and good image are given; public policy objective of greening urban logistics applies Transferability is given, as the business model is profitable

	High impacts on mileage and emissions
Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☐ Yes ☐ No
	Are there special requirements for the transfer to different countries, regions or cities (e.g. legal system, language barriers, size)?
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Private investment in new facilities in city centre area is a classical real estate development that is principally applicable anywhere else.
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 regulation needed. Political will to maintain the mixed usage inside a housing and commercial area, in order to include logistics facilities in city centre.
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
	Suitable for large 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. Many other cases of UDC. Beaugrenelle is a new, recent one, improving the energy efficiency of the site, the vehicles for the last mile and the integration in the neighbourhood.
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☐ Yes ☒ No
	Early stage development.
5.2) References	http://www.sogaris.fr/espace-urbaine.php Chronopost press kit for the inauguration of Beaugrenelle UDC Christophe Rippert presentation at Bestfact Workshop, Amsterdam, 22 June 2012.

	http://www.wk-transport-logistique.fr/actualites/detail/67019/31-37-quai-de-grenelle-la-nouvelle-adresse-parisienne-de-chronopost.html
5.3) Contact	
5.4) Date of review	Spring 2014
5.5) Pictures	**Figure 5: Logistics scheme of Beaugrenelle UCC**  **Figure 6: Chronopost Goupil van used for deliveries starting from the UCC Beaugrenelle**  **Figure 7: UCC Beaugrenelle architecture concept, picking and sorting area**

	 © SAGL - Architectes Associés © Popy-Rea-Chronopost © Popy-Rea-Chronopost Sources: http://www.valdemarne.com/sites/default/files/sogaris-espace-urbain-beaugrenelle.png
5.6) Involvement of SME	No SME involvement.
5.7) Impact on SME	No impact on SMEs.
5.8) Opportunities for SME	Opportunities are not available for SMEs.

3.3 Smart Urban Logistics

Basic information	
1.1) Identification	Smart Urban Logistics
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	ECONSULT Betriebsberatungsges.m.b.H.
Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ■ Public & private appr.
2.2) Actor classification	▪ public authorities (ministry, funding, administration, research, etc.) ▪ private companies (logistics, forwarders, trade, industry, etc.) ▪ associations of cities ▪ experts on logistics and traffic planning ▪ universities and research institutes
2.3) Geographical area	From which country (and city) does the practice originate? Austria, Vienna
2.4) Type of city	Which type of city? ■ Large: >1 million inhabitants ■ Intermediate: 50,000 to 1 million ■ Small: < 50,000 inhabitants
2.5) Implementa-	Please indicate and explain the status of the case you describe.

tion status	■ Evolving Best Practice ☐ Best Practice
	The initiative Smart Urban Logistics was started in 2013 and comprises different phases. The start of pilot projects if foreseen for the year 2015.
2.6) Date of implementation	2013
2.7) Link to other clusters	The initiative also promotes solutions in urban freight based on topics of - Cluster 2: Green Logistics and Co-modality - Cluster 3: eFreight
2.8) 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
2.9) 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 …

2.10) Supply chain elements	The initiative addresses all elements of the supply chain and is not dedicated to any specific branch, industry or processes.
2.11) 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: …
2.12) 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)…
Best practice	
3.1) Description of the practice	Freight traffic in urban areas is a complex network of partially independent subsystems and components. Sustainable measures need to be identified, developed and implemented overall but also in the individual fields of action. Existing and new instruments are intended to contribute in the future, step by step, to making logistics and freight traffic in conurbations smarter and more efficient. The Austrian Climate and Energy Fund's annual programmes 2013 to 2014 therefore included preparatory work for new subprogrammes under the names "Smart Urban Logistics" and "Efficient Freight Traffic in Areas with High Population Densities." A focal point of the Climate and Energy Fund's work are Smart Cities demonstration projects. Continuous growth of our cities whilst resources diminish at the same time makes rethinking city planning imperative in the medium term. The constant growth of the cities and the problems caused thereof demand new solutions in urban planning. In this context one of the core topics are mobility and traffic. Intelligent and novel structures are necessary in order to improve or at least maintain the quality of living for the people. The aim of the initiative “Smart Urban Logistics” was to build up an Austrian networking platform to boost and promote intelligent solu-

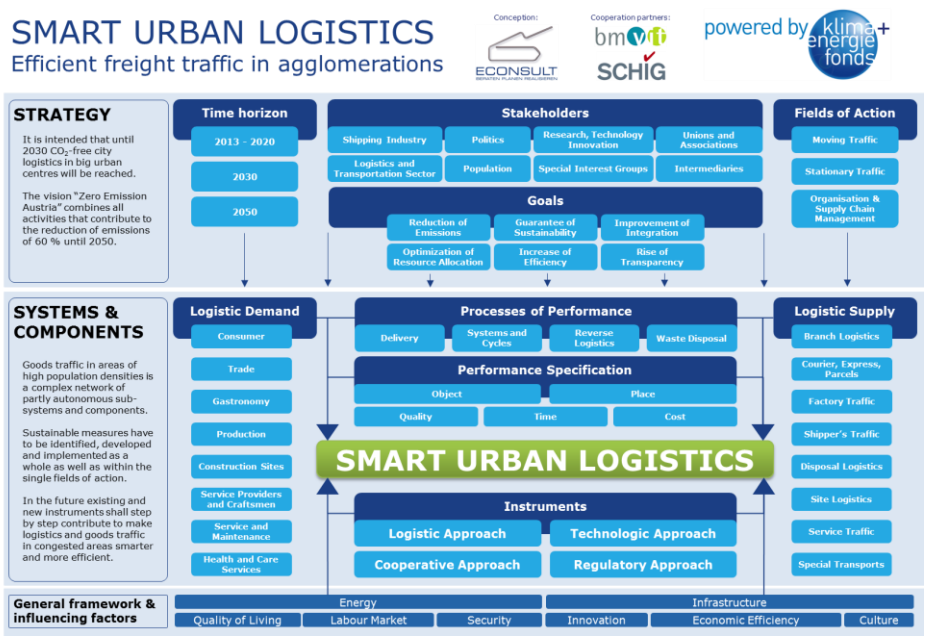
	tions in the field of urban logistics. The intention was to make stakeholders aware of the topic, to create acceptance for innovative technologies, to initiate a communication process, to support further discussions and to be the incentive for the start of pilot projects that help to design future cities. The whole initiative has been set-up on a long-term programme for several years and consisted of three phases: ▪ Phase 1: Development of a strategic roadmap concept and implementation of a stakeholder platform. ▪ Phase 2: Elaboration of supporting topics in order evaluate framework conditions and to prepare information for implementation activities: – Topic 1: Requirement analysis of cities – Topic 2: Best Practice Toolbox – Topic 3: Framework conditions and policies – Topic 4: Management of the Stakeholder process ▪ Phase 3: Set-up of coaching and implementation activities in cities with the goal to initiate pilot projects. Together with the draw up of the common strategic roadmap concept a “Smart Urban Logistics Platform” was founded and implemented in order to accompany the initiative.
3.2) Technical main characteristics	Within “Smart Urban Logistics” four different main approaches are distinguished: ▪ The logistic approach which embraces measures for the optimization of processes and services. Existing or new logistic instruments are used to develop new solutions in urban logistics. ▪ The co-operative approach aims at developing and implementing projects in a collaborative framework of different partners. Innovation and efficiency shall be supported by the co-operation of stakeholders working together for a common goal. ▪ The technological approach aims at further development and implementation of (new) technologies. Technological solutions can come out of research in the fields of software, hardware, telematics, automotive engineering or equipment. ▪ The regulative approach deals with the possibilities and impacts of subventions and restrictions in urban logistics. Further the discussion addresses questions about the legal and the regulatory framework. These approaches were identified as the main triggers to start a project in the field or urban freight solutions. This theoretic system simply offers a framework to classify and discuss projects and initiatives in urban freight, in everyday practice nearly every project shows a multi-dimensional approach.
3.3) Success factors	One of the core areas of a "smart city" is its management of mobility and traffic, and freight traffic in particular. In this area, new, intelligent structures are required to improve the quality of life for humans and to guarantee the city as an efficient enterprise. As part of the "Smart Urban Logistics" platform, activities for the support and development of efficient freight traffic in areas with high population densities are therefore initiated and supported.

	The platform carries out coordination and administration tasks. Another goal here is the coordination with other current or planned programmes, initiatives and actions. During the first phase, the platform was coordinated by the Climate and Energy Fund, the bmvit (Federal Ministry of Transport, Innovation and Technology), and the Railway Infrastructure Services Company (Schieneninfrastruktur-Dienstleistungsgesellschaft mbH). The success was dependent on the ability of the initiative to integrate the relevant stakeholders into the process. They accompanied the process as members of a steering committee and got information on all the activities of the project in order to spread it within their sphere of influence. Strategic steering meetings were held several times a year and the results and information of the meetings directly influenced the platform, the funding programs of the Austrian government as well as further activities within the initiative.
3.4) Main benefits	The project supports the aims of various goals and strategies declared by the European Union and the Austrian Republic as for example the Europe 2020 strategy published by the European Commission in 2010 or the Zero Emission Austria vision. To face existing or upcoming problems it was necessary to bring the existing forces together. This initiative linked on a national level the activities of the different stakeholders and accompanied and supported them in the long run. Due to the nature of the initiative it was necessary to provide public funding instruments. From the beginning various public authorities were involved and the access to non-departmental public organizations was granted in order to set-up the platform. All involved stakeholders helped to disseminate results and to make the initiative well known. “Smart Urban Logistics” was successfully implemented as a national platform and is also recognised as a brand for ideas, networks and coordination of projects dealing with urban logistics. Within the “Smart Urban Logistics” process a framework of objectives for projects on urban transport has been set up in order to easily evaluate different projects and approaches. According to that they must reach a reduction of emissions and prevent the waste of resources. Moreover, ecologic, economic and social sustainability has to be considered. The projects must be able to help increase the overall efficiency of the supply of cities with goods and improve the integration of (existing) systems as well as increase the transparency of logistics processes in Smart Cities. The “Smart Urban Logistics” initiative provides its results and outcomes not only for its members, it tries to stimulate the overall discussion about urban logistics and to provide potential solutions for all stakeholders. It is an important measure to multiply benefits obtained by innovative projects and to foster co-operations in the field of urban freight transport and logistics.
3.5) Cost indication	Not available
3.6) Barriers / Limitations	In the past it could be experienced that a big number of R&D projects never were continued as practical projects although they were con-

	sidered to have realistic chances of success. There seemed to be a gap between the first research activities which has to be made to find innovative solutions and the further steps towards the implementation of the solution. This phenomenon regularly marked the end of a promising innovation process. The “Smart Urban Logistics” initiative was especially aware of that danger and tried to overcome this barrier by sensitising the project partners to that problem, to bring actors together and to promote future-oriented topics that focus on transferable solutions.
3.7) Common practice before implementation	Before the implementation there was no common information or stakeholder platform in order to coordinate and interlink between different activities targeting innovative urban freight solutions. Similar projects were started, dealing with similar questions and evaluating similar framework conditions instead of joining forces for one common approach. The “Smart Urban Logistics” initiative is now recognised as a one-stop-shop platform for this topic, covering a huge network of stakeholders, public authorities, information and process know-how and links to potential funding sources and programmes. Furthermore hardly any urban logistics project in the past was present in the public perception. No activities in public relations took place and no stakeholder-processes were established. With “Smart Urban Logistics” this has changes, public awareness for this topic has massively increased and also cities are addressed very directly in order to develop freight masterplans and to support implementation actions.
3.8) Motivation/problem	The motivation to start the initiative was mainly driven by the idea of creating a platform to bring stakeholders together. It was one major criterion not only to define a project, but a structure for a long-term initiative. This structure shall provide a sustainable supporting process and shall give the framework to develop pilot projects for implementation.
3.9) Justification of practice	This initiative is initiated by public authorities (ministry, funding, administration etc.) on a national level, providing one common framework for all further activities in the topic of “Smart Urban Logistics”. It addresses the main issues settled in the EU Urban Mobility Package “A call to action on urban logistics”, Brussels, 17.12.2013, SWD(2013) 524 final: ▪ Lack of focus and strategy on urban logistics ▪ Lack of co-ordination of urban logistics actors ▪ Lack of data and information This nation-wide initiative dealing with frameworks conditions, requirements of cities, best practices in logistics as well as legal conditions and policies can serve as an example for other countries, regional authorities and cities.
Transferability and scalability	
4.1) Geographical	Can the solution be transferred to other countries, regions or cities?

Area	■ Yes ☐ No
	Smart Urban Logistics is a successful example showing how a platform and a reference process have to be built up. This reference process itself can be used in all environments. The result of the process will differ according to the circumstances of the region.
4.2) Scaleability, growth potential	Can the solution be scaled-up, growth and obtain a bigger market share? ■ Yes ☐ No
	The initative motivates and supports stakeholders to work on the topic and brings the actors together. So the solution helps to increase motivation and action which leads to further promising developments. The process is adaptable for a nation-wide initiative as well as a stakeholder-process within a small city.
4.3) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	One important output of the project was a strategic roadmap, which illustrates all relevant players, conditions and components that influence “Smart Urban Logistics” projects. As is provides modular approaches and solutions, it can be transferred to all actors or industries.
4.4) 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
	Public funding was necessary to start the initiative. As the creating of reference process for a topic of common interest is not a provided by commercial players, it had to be initiated and supported by public stakeholders and authorities. Public funding was necessary to start the initiative, therefore legal basis needs to be in place.
4.5) 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 and the approach for the initiative is generic and offers a general perspective, that is not subject to any regional restriction.
4.6) Similar cases	There is a French National programme “Marchandises en Ville” but the approach in France is more focussed on data collection and research.
Additional information	
5.1) Consideration for in-depth	Should this case be further considered for in-depth review? ☐ Yes ■ No

analysis	Currently the initiative is in the second phase of planning, an in-depth analysis would be recommendable after the set-up of pilot projects.
5.2) References	http://www.smartcities.at/foerderung/smart-urban-logistics/
5.3) Contact for further details	Mag. Jürgen Schrampf ECONSULT Betriebsberatungsgesellschaft m.b.H. Jochen Rindt-Str. 33 1230 Wien Austria T: +43-1-615 70 50-34 j.schrampf@econsult.at www.econsult.at
5.4) Date of review	24.09.2014
5.5) Pictures	**Figure 8: Logo of the initiative** smart urban logistics Eine Initiative des Klima- und Energiefonds **Figure 9: Illustration of Smart Urban Logistics** 

	Figure 10: Conceptual model and components of the initiative 
5.6) Involvement of SME	The initiative is open to all stakeholders and companies and all results and outputs are relevant for SME as well.
5.7) Impact on SME	There shall be impact on all stakeholders, but especially on SME which do sometimes not have own resources or access to know-how to address these topics in the field of "Smart Urban Logistics". Results are published, so that also SME have access to relevant information, state-of-the art examples and guidelines to set-up projects.
5.8) Opportunities for SME	The opportunities for SME are various and very much depending on the focus of business. "Smart Urban Logistics" offers a generic and modular set of information and recommendations and shall stimulate all stakeholders to implement successful solutions for more efficient urban freight transport and logistics. The material provided shall speed up the process and reduce time and cost especially for SME, normally used for searching and evaluation of information.

3.4 EMILIA - Electric Mobility for Innovative Freight Logistics in Austria

Basic information	
1.1) Identification	EMILIA - Electric Mobility for Innovative Freight Logistics in Austria
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	ECONSULT Betriebsberatungsges.m.b.H.
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.
2.3) Geographical Area	From which country (and city) does the practice originate? Austria, various cities
2.4a) Type of city	☒ Large: >1 million inhabitants ☒ Intermediate: 50,000 to 1 million ☒ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	The project has been set-up in 2014 as a national flagship project to implement best practice test-beds for electric mobility in urban freight business cases.
2.5) Date of implementation	2014
2.6) Link to other clusters	-
2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ■ Access to transport networks, infrastructure and nodes ■ Freight consolidation and transhipment ■ Implementation of low emission technologies ■ IT-technologies and solutions (for management and administration) ■ Innovative vehicles, vessels and equipment ■ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ■ Business to business (B2B) solutions, cooperation ■ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ■ Communication between authorities: cooperation, procedures, legal frameworks ■ Communication between businesses and authorities: coordination, consultation ■ Business models: new form of ownership, risk management ***Operations and Services*** ■ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ■ Innovative operational solutions ■ Value added services, development (or extension) of services ■ Service quality and sustainability agreements/certification ■ Transport management, fleet management ***Regulations and Policy*** ■ Access rules and restrictions of urban areas ■ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ■ Environmental standards and policy ■ Interoperability and standardisation: vehicles, equipment, loading units, infrastructure ☐ Safety and security: measures, regulations, insurance ***Knowledge, Tools and Methods*** ■ Modelling and forecasting ■ Data collection and statistics ☐ Education and training

	■ Working and implementation guidelines ■ Monitoring and benchmarking of processes
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 project covers mainly the elements and processes in the fist- and last-mile in urban freight distribution and collection of goods. In retail processes the final handling, cross-docking, transhipment, transport and distribution processes are considered. The focus of the project is on transport, in retail scenarios also the final handling and hub processes, cross-docking, transhipment and overall distribution strategy are considered.
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): Raised awareness of the possibilities and opportunities offered by e-mobility for freight logistics.
Best practice	
3.1) Description of the practice	The growing significance of city freight transport and logistics is related to increased and still increasing population in urban areas. The result is a rising demand for freight transport. Furthermore, as urban freight transport deals primarily with the distribution of goods at the user end of the supply chain, many deliveries tend to be made in small loads and in frequent trips, thus resulting in many vehicle kilometres. These developments seriously affect the environment of cities

	in terms of pollution, noise and CO_2 emissions. Politics had to react to these changes and started defining goals and taking measures to reduce emissions in urban centres. The project EMILIA focuses on these three major goals: ▪ The raising of awareness for the topic of e-mobility in urban logistics, ▪ the improvement of technologies to carry out transports in urban areas using ecologically friendly vehicles and ▪ the optimization of transport chains with novel logistics concepts, planning algorithms and applications In the first project part an open innovation process is started. The idea of open innovation is to open up the internal innovation process in order to increase the innovation potential and to develop a detailed understanding of the current environment. Representatives of logistics/delivery companies of the industries “food trade”, “goods delivery” and “service companies”, as well as OEMs (Original Equipment Manufacturer), vehicle suppliers (leasing associations) and opinion leaders in the field of transport and logistics, delivery business and e-mobility seized the opportunity to exchange their knowledge as well as their different points of view. Relevant key findings regarding business requirements, expectations and barriers for optimization strongly influence the results of the project. In the second project part three different prototypes of electric vehicles are developed: An electric cargo tricycle, an electric light utility vehicle and the EMF Citylog. The aim of reengineering these vehicles for urban logistics business cases is to achieve cost reductions through efficiency improvement, weight reduction and range extension. The vehicles are adapted and optimized to the requirements of different transport logistics providers. In a test-bed and during real life operation a simulation model for upscaling the effects of the pilot is developed and implemented. The third part comprises the development of novel and innovative freight logistics concepts for the supply of urban areas especially tailored towards a significant use of electric mobility. The logistics concepts focus mainly on operational feasibility, sustainability, and profitability. The concepts are evaluated by applying criteria such as ecological, economical, and social impacts. The most promising concepts are selected for further consideration and the conception of roll-out scenarios. In a last step the results of the vehicle development are linked to the further elaborated freight logistics concepts. The developed research demonstrators are deployed, demonstrated, and evaluated in close collaboration with the application partners. It will be shown that there is a considerable potential for the usage of electric mobility in an urban logistics setting and that the well-planned usage of electric vehicles is economically viable while having a positive impact on the environment.
3.2) Technical main characteristics	▪ Open Innovation: An open innovation process supports the whole development and implementation phase of the project, providing internal and external Know-how-transfer between all stakeholders. ▪ Electric cargo tricycle: The goal is to realize an energy efficient

	and high performance powertrain for an electric cargo tricycle. The electric powertrain components shall be specified, optimized, realized and integrated into the chassis. One focus is on the design of a novel PM synchronous motor utilizing SMC components for the axial flux guiding. The other focus is on the design of the power electronic inverter including a new control system for the interaction of the electric drive and a continuous variable transmission (CVT). ▪ Electric light utility vehicle: The goal is the realization of an optimized electric powertrain for a light utility vehicle. Specific development goals are a 10% cost reduction and a 20% weight reduction for the electric motor, plus a 15% range extension for the EV. The electric powertrain components will be specified, optimized, realized and integrated into the chassis. ▪ EMF Citylog: The main innovations of HET's Citylog are the hydrogen hybrid drive, the lightweight structure and the new four wheel steering concept without any mechanical connection between the steering control (Joystick) and the wheels. With this steering concept all four wheels can be turned around ± 90° independently of each other by electric steering motors. ▪ Vehicle Simulation, Modelling and Identification: Simulation models of different vehicle types shall be implemented and developed in a simulation environment. These models will be validated and prepared to develop energy estimation algorithms which will be integrated into a routing application. The focus is to implement an entire vehicle simulation including auxiliaries in order to guarantee accurate routing. The different vehicle concepts contain all of the vehicle components that are relevant for the calculation of the energy consumption. ▪ Dynamic Operational Planning: Novel methods and applications for planning and managing the transport operations are developed for implementing the new logistics concepts. The developed applications will allow a priori planning as well as the real-time management of the delivery vehicles.
3.3) Success factors	The success of the project is due to the fact that a very broad consortium of 15 partners, employing around 100.000 people, and coming from different fields of economy, are partnering to set-up pilot scenarios for best practices. These companies with different goals and backgrounds work together on technological and organizational questions. Together they are in a position to check and evaluate the results with a combined fleet of about 1.500 vehicles, driving more than 64 million kilometres a year, offering an absolute annual CO_2 reduction of 12.5 tonnes. Additionally to this bottom-up approach the partners decided to integrate further participants into the project by making it an open innovation initiative. Therefore an online tool has been established in order to be able to benefit from results of other projects as well as to exhibit the results of the project to a broad public, ensuring that the project receives the full attention of relevant target groups. The early stakeholder integration also ensures the raising of awareness and acceptance within potential customer groups.
3.4) Main benefits	Electric vehicles are more energy efficient, quieter and they produce significantly lower levels of CO_2 and air pollutants compared to standard vehicles. As a result the deployment of electric vehicles is an im-

	portant measure in the reduction of emissions, especially in the context of urban freight transport solutions. As there is still room for improvement, technical as well as logistics optimizations (e.g. considering the loading times in optimizing supply chains) help to magnify these advantages of e-mobility even more. Furthermore, its use contributes to minimizing the dependence on fossil fuels in the future. Because of the above mentioned advantages (especially noise and air polluting emissions) electric vehicles can be permitted in times or areas which are usually restricted to transport activities. This fact improves the flexibility and productivity of the carriers and counteracts the effects of traffic jams (with their financial, economic and ecological disadvantages). Furthermore, research on improved and new intelligent technologies or organizational improvements helps to elevate the attractiveness of Austria for researchers and investors as an interesting economic and R&D-location. Electric mobility opens up entire new economic and societal opportunities: green tourism, novel vehicles with built-in fun factor, the ease of mobility for special user groups, and much more.[1]
3.5) Cost indication	-
3.6) Barriers / Limitations	It cannot be denied that "currently the purchase price and total cost of ownership (TCO) for EFVs are significantly higher than for conventional vehicles", especially because of high battery cost and limited production volumes. Moreover, the second hand market, as well as the residual value of EFVs, is not yet clearly known.[2] These facts together with a lack of experience in their use deter many logistics service providers from investing in these vehicles. The particularities of the operation of electric vehicles raise various questions which often form too great a challenge (organization, planning, financing, maintenance, technique, legal questions, etc.) not only for small enterprises. Within the discussion about electric mobility criticism is being voiced regularly that the cost as well as the ecologic advantage of the technology is not determinable, as this is a question of the scope of the considerations. Without being able to solve this problem the project tries to define and coordinate all relevant aspects (technology, implementation field, etc.) and test the application in demonstration. This helps to draw a realistic picture of the implementation scenarios.

[1] http://www.ecoplus.at/en/ecoplus/cluster/e-mobility/about-initiative

[2] FREVUE D1.3 State of the art city logistics and EV, S. 2

3.7) Common practice before implementation	Hardly any electric vehicles exist in the public perception for the delivery of goods in urban areas. Conventional cars which are hardly limited in the access to the city centres (exception: weekend and night access regulations) supply the individual customers. Parcel distributors have optimized their routes without cooperation with other service providers. The awareness of problems concerning freight transport in urban areas is only increasing within the scientific community and politics, but the public pressure for change is still rather low. No practical, big scale experience exists in Austria in the field of electric mobility for freight transportation in urban business scenarios.
3.8) Motivation/problem	Delivery of goods to urban areas is mostly organized individually by carriers authorized by retailers using standard vehicles. The common problems they have are empty runs, the decreasing degree of capacity utilisation, parking problems, traffic jams, restrictions in delivery times, etc., which directly influence their productivity as well as their competitiveness. On the other hand the political pressure is increasing, similar to arising problems in bigger European cities and due to proclaimed goals of the EU. So the necessity to find viable and sustainable solutions came from different directions, not necessarily solving actually existing problems, but being prepared for upcoming challenges in the future.
3.9) Justification of practice	The project is Austria's largest initiative for the implementation of electric vehicles for urban freight. It was nominated a flagship-project within the initiative "Austrian Electric Mobility Flagship Projects", supported by the Austrian Climate and Energy Fund and the Austrian Government. The project managed to bring various important stakeholders from different sectors with different backgrounds and numerous capabilities together to work on a common solution. Additionally a comprehensive range of dissemination activities is executed from the start to the end of the project, offering transparent information to the stakeholders and the public. Within the project essential research and inputs of experts are considered in the deployment phase. All theoretical results are verified by real-life demonstration scenarios and the evaluation process is conducted in close cooperation with the application partners, thus allowing for necessary process adaptations. The established project network and the results are expected to generate a high market response, leading to further pilot- and implementation cases and a rising demand for e-vehicles in the transportation and cargo logistics sector.
Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ■ Yes ☐ No

	The project shows two results which are aligned with each other: the technical solution and the logistics concept. As the technical solution is based on three different vehicles (Electric Cargo Tricycle, Electric Light Utility Vehicle or EMF Citylog) there is a possibility for situational implementation scenarios depending on the specific requirements of the country, region or city. The design of the logistics concept takes into account the properties, advantages and limitations of electric mobility. It is especially tailored towards a significant use of electric cargo vehicles and shows that using electric vehicles in urban logistics is technically feasible and economically viable.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	The high number of different participants in this project, as well as the integration of different urban settings, covers a wide range of actors and/or industries even within the demonstration and evaluation phase.
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
	Although no political or regulatory barriers restrained the best practice case, it is without doubt that a modification of the restrictions for transport in urban areas would further stimulate the dissemination of the application.
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
	One of the goals of the Transport White Paper announced by the European Commission in 2011 is to “halve the use of ‘conventionally fuelled’ cars in urban transport by 2030; phase them out in cities by 2050”. EMILIA is dedicated to playing an important role in achieving this goal. Therefore it is planned that the concepts and technologies developed and tested in EMILIA will become essential parts of new supply chains and last mile solutions. EMILIA will also deliver results of e-mobility technology and logistics concepts, which will contribute to further implementation in other countries.
4.5) Similar cases	The particularity of this best practice project is the interlinkage of improved technology and novel logistics concepts. There are of course other similar cases within the EU, focussing on new technologies or intelligent concepts, but the linkage of the two approaches distinguishes EMILIA from other practices, and makes it a unique approach.

Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	As a national flagship project, the results of the conception and the demonstration phase will influence the further development of e-mobility in logistics. Politics and industrial stakeholders will both follow the results and they will deduce criteria for their further strategic decisions on e-mobility. The proof of the implementation and growth potential is one goal of the project, therefore the projections and prognosis of further development of urban freight is an important issue.
5.2) References	References and sources used to provide the given information http://www.austrian-mobile-power.at/ http://www.ait.ac.at/departments/mobility/
5.3) Contact for further details	Dipl.-Ing. Heimo Aichmaier Austrian Mobile Power www.austrian-mobile-power.at heimo.aichmaier@austrian-mobile-power.at Mag. Jürgen Schrampf ECONSULT Betriebsberatungsges.m.b.H www.econsult.at j.schrampf@econsult.at Mag. Boschidar Ganev, MSc. AIT Austrian Institute of Technology www.ait.ac.at boschidar.ganev@ait.ac.at List of all project partners: AIT Austrian Institute of Technology LKR Leichtmetallkompetenzzentrum Ranshofen (LKR) Clusterland Oberösterreich GmbH (AC OÖ) Austrian Mobile Power (AMP) Bitter GmbH (Bitter) DPD Direct Parcel Distribution Austria GmbH (DPD) ECONSULT Betriebsberatungsges.m.b.H Gebrüder Weiss Paketdienst Gesellschaft mbH (GWP) Gleam technologies GmbH (Gleam) HET Hochleistungs- Eisenbahn- und Transporttechnik Entwicklungs-GmbH (HET) Innovation Service Network GmbH (ISN) MAGNA STEYR Engineering AG & Co KG (MSE) Miba Sinter Austria GmbH (Miba) REWE International AG (REWE) Schachinger Immobilien und Dienstleistungs GmbH & Co KG (Schachinger) SIGNON Österreich GmbH (Signon)
5.4) Date of review	22.09.2014

5.5) Pictures	EMILIA ELECTRIC MOBILITY FOR INNOVATIVE FREIGHT LOGISTICS IN AUSTRIA **Figure 11: Concept and logo of EMILIA**  
5.6) Involvement of SME	There are various SME involved in the project and in the whole e-mobility market. Some companies developing new vehicles and prototypes are SME, as this market segment is actually not large enough for the big players. So the SMEs play an important role in pushing and promoting innovation in this sector.
5.7) Impact on SME	The impact on SME can differ, especially for those focussing on technology development. They either aim at making the step towards serial production and growing business or they try to cover niche markets or regional markets with tailor-made and customer-oriented productions (e.g. special vehicles that are converted or rebuilt for special industry sectors). In any case, the contact to potential customers within the pilot settings provides feedback and reveals requirements that need to be covered.

3.5 LOGeco − eco-friendly logistics

Basic information	
1.1) Identification	LOGeco − eco-friendly logistics
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	Andrea Campagna (Sapienza Università di Roma) Katja Hanžič (University of Maribor)
Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	• Association of Manufacturers and enterprises of Rome, Frosinone, Latina, Rieti, Viterbo (Unindustria Lazio) • Chamber of Commerce Rome • Centre for Transport and Logistics (CTL) at the University of Rome "Sapienza" Cooperation Partners: • electric utility company (ENEL) • vehicle manufacturer (RENAULT) • transport and parking infrastructure manager (SABA PARCHEGGI) • express courier (SDA) • logistics companies (FM Logistic, SG Demand & Supply Chain Management, Mag-Di s.r.l - Soluzioni Logistiche) • general construction company (L.I.E.S. impresa generale di costruzioni) • car rental company (Amico Blu)
2.3) Geographical area	City of Rome – Tridente Mediceo (Historical Centre), Italy The best practice in being implemented on a smaller geographical area of the historical centre of Rome – Tridente Mediceo: • Total surface area: 440.000 square meters • Residents: 3.471 • Residential building: 2,384 • Parking spaces on the road: over 300 • Companies: 1.765 • Employees: 8,466
2.4) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.5) Implementation status	☒ Evolving Best Practice ☐ Best Practice The best practice is ongoing.
2.6) Date of implementation	2011: Survey on traders and traffic counts 2012: First Testing Phase - with transit point and two electric vehicles.

	2013: Second Testing Phase - with different supplies chain and different vehicles and business sector. • Expansion of test on HoReCa distribution (temperature controlled) schemes; • Activation of 2 Transit Points • Gianicolo Parking for the 35 quintals vehicles • Villa Borghese park for Renault Kangoo 4 mc • UDC stationed at the plant storage of Via Prenestina made available by Magdi • During 2013 this phase has been designed and the municipality requested due time for financial setup of the initiative. 2014: In July 2014 the second testing phase has been launched. The project is ongoing and is expected to end in June 2015.
2.7) Link to other clusters	The described best practice can be linked to Cluster 2 (Green Logistics and Co-Modality) as it uses electric vehicles therefore reducing CO2 emissions. It also has some links to Cluster 3 (eFreight) as it uses software solutions (online platform)
2.8) 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

2.9) 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 …
2.10) Supply chain elements	Transfer points, transhipment platforms: loading – transport – unloading
2.11) 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: …
	Please specify all other and different targets here…
2.12) 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:
Best practice	
3.1) Description of the practice	The LOGeco project deals with design and validation of a new model for urban logistics solutions that entails innovative and sustainable actions. LOGeco started for example a new management process for City Logistics policy in Rome Trident, set-up an Urban Consolidation Centre, increased the use of clean vehicles, contributed to change in regulation and access rules to certain area, and to increase in logistics operation efficiency. LOGeco involves all the relevant public and private stakeholders operating in the different distribution chains affecting the urban freight sector, and defines sustainable solutions for the 'last mile', including electromobility, for the benefit of the liveability of the urban environment and, at the same time, of the tourist and commercial activities. LOGeco has been created within the activities of the Group of Transport, Infrastructure and logistics of UNINDUSTRIA. Inspired by the pedestrianization project of the "Tridente" area in Rome, LOGeco

	defines and puts into practice a new procedural model for city logistics solutions, together with practical operational solutions in the short/medium term and the information useful for the effective and efficient implementation over the long term. The aim is to reduce the impact of freight entering the historical area without penalizing economic activities, but rather creating business opportunities for companies in the area. The small geographic area of Tridente hosts 1.112 businesses - 785 independent businesses and 327 brand shops and stores belonging to retail chains. 44% of businesses reported (490) belong to the sector of retail trade of clothing, footwear, leather bags and accessories while 18.3% (203) are the HoReCa sector (Hotels, Restaurants, Bars). Jewellers and goldsmiths together account for 8% of the surveyed activities. Every day over 19,000 vehicles enter the Trident out of which more than 1,000 are freight vehicles. (freight traffic would represent here more than 5.26% of total traffic, normal would be around 20%, below 4% are mentioned: any explanation? Trucks only or including small vans?) The model allows to: • implement the policies of the Administration; • understand the needs of the involved industries; • meet criteria for the improvement of the current distribution practices according to environmental, social and business sustainability. The model consists of a tool ordered to create the conditions to promote economic activities within the supply chains affecting urban distribution flows. By means of direct institutional actions supported by the Administration with the involvement of stakeholders (mobility agency, industrial associations, retailers, shop owners, transport operators, etc.) it LOGeco is a viable and sustainable solution. Designed for its economic sustainability in the long run, it is not dependent on municipal funding. As a result, the good practice aims to make the distribution process in urban areas more efficient in terms of costs, time saving and environmental impact. LOGeco has shown: - the ability to have important results regarding the energy efficiency for the last mile; - the viability and sustainability of the identified solutions. The first phase of LOGeco tested a Transit Point with electric vehicle distribution, while in the second phase of LOGeco urban logistics nodes for the last mile goods distribution of several supply chains with additional vehicle technology (e.g. LNG, hybrid) were being tested.
3.2) Technical main characteristics	• Hardware: an on-board computer in the Renault Kangoo ZE; • Software: Fleet management system for the vehicle tracking, owned by the Centre for Transport and Logistics (CTL) at the University of Rome “Sapienza”; • Application model with structured questionnaires for the involved supply chains.

3.3) Success factors	The policy adherence to LOGeco and the operation of the Public/Private partnership with the establishment of a management committee ensures that institutional actions involve the participation of stakeholders (agency mobility, industry associations, traders, etc.). The approach has been win-win for the PPP. The project, for its complexity and multisectoriality, has required many qualified contributions: at first Roma Capitale, "Sapienza" University, Mobility Agency of Roma Capitale, but also important enterprises associated with UNINDUSTRIA have provided their expertise and specific experience. Among these are: ENEL; Renault, which has provided the means for testing electric Kangoo; logistics operators like as Sg Logistic Solutions, FM Logistics; SDA express courier; Saba Italia, LIes.
3.4) Main benefits	LOGeco contributes substantially to the reduction of consumption for last mile transportation. With regard to the test, 218 kg of CO2 saved were calculated for each vehicles in the experimentation period. A drastic reduction of the CO2 emissions in Rome City Centre, bringing up – at the same time – a new distribution model able to positively affect not only the environment but also business aspects and quality of life. Demonstrated: • The traffic that affects the area of Rome City Centre is composed of only 4% of freight vehicles, whose contribution to the environmental impact (emissions, noise and vibration, congestion), however, is very significant because of the type of means typically used (diesel) and the distribution practices (stop in second rows, make frequent stops over short distances, slowing down to look for a break, stop in prohibited areas, multiple passes, discharge times, etc.). • Over 70% of the business in the area does not fall in the category of big brands, or large-scale distribution. In respect of this, city logistics solutions like LOGeco would have a beneficial effect on reducing the impact of freight traffic; • The implemented solution should also be considered for the movement of personnel (sales representatives, technicians, maintenance, etc.) in the testing area; • The cost per kilometre of an electric vehicle is up to 5 times less than an equivalent gas oil vehicle; • The distribution practices are conditioned by the type of service that, in urban areas, also involves several stops on a few metres, making the use of conventional vehicles untenable from an environmental point of view.
3.5) Cost indication	Test phase: €. 180.000,00
3.6) Barriers / Limitations	LOGeco has demonstrated to be an effective model, which would create conditions to promote economic activities within the supply chain that affect urban distribution flows. Barriers encountered are mainly concentrated in particular barrier of lobbies, of traders and citizens who, for example, do not want any change. The absence of a political agenda on the topic may specify a risk to the implementation of innovative policies and introduction of efficient technologies. More than 40 meetings with stakeholders have solved

	most of the difficulties presented. Distribution in urban areas can represent a difficult issue but implementing local and customized green solutions (as LOGeco does) can have positive effects not only on CO2 emission but also on business and welfare policies.
3.7) Common practice before implementation	No use of electric vehicles for last-mile distribution and no initiative of public-private collaboration to setup a transit-point have been in place. Specific knowledge on last-mile phenomena, such as type and dimension of the different supply chains characterizing the freight demand in the area, was not available to the Municipality. No public approach to planning logistics solutions was active.
3.8) Motivation/problem	LOGeco has been created within the activities of the Group of Transport, Infrastructure and logistics of UNINDUSTRIA. Inspired by the pedestrianization project of the "Tridente" area in Rome, it aims at identifying practical operational solutions in the short / medium term to reduce the impact of freight entering the historical area without penalizing economic activities, but rather creating business opportunities for companies in the sector.
3.9) Justification of practice	**Innovation and feasibility**: LOGeco is a viable and sustainable solution improving current distribution practices with a view to environment, society and business. Designed for its economic sustainability in the long run, it is not dependent on municipal funding. **Strategic focus**: Definition and implementation of a new procedural model for city logistics solutions, together with practical operational solutions in the short / medium term and the information useful for the effective and efficient implementation over the long term. **Impact**: Reduction of the CO2 emissions in Rome City Centre and at the same time implementation of a new distribution model positively affecting not only the environment but also business aspects and quality of life. **Transferability**: The LOGeco model is highly transferable because it is generalised. It is a method to arrive to suitable solutions for the last mile for every urban context.
Transferability and scalability	
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) Scalability, growth potential	Can the solution be scaled-up, growth and obtain a bigger market share? ☒ Yes ☐ No
	The solution can be scaled up, as there are no constraints for obtaining bigger market share. LOGeco solution is very flexible and generalised - it is a method to arrive to suitable solutions for the last mile for every urban context.

4.3) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Modified model could be used in any area with great density of industry, retail or production in geographically limited area.
4.4) 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
	Best practise case encompasses also the administrative requirements for adaptation of legislation and framework conditions in favour of the project.
4.5) 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
	Every urban area would benefit from the given model, which is quite generalized and therefore adaptable to different areas.
4.6) Similar cases	As for the technology used (electric vehicles) and the type of logistics solution adopted in the first stage of the proect (transit point), several cases can be found in Europe (e.g. Paris, Utrecht). As for the approach to generate solutions with the involvement of public authorities and private operators in a win-win logic, and using an overall method from data collection to business modelling through business opportunity evaluation, we can state this is the first case.
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	The project LOGeco directly addresses some of the key strategic targets limited climate change, reduced emissions, ideal utilisation of infrastructure, competitive logistics and transport system, acceptance and influence, limited climate change, reduced emissions and increased efficiency/productivity of logistics processes. The case is highly transferable and has full access to information.
5.2) References	http://www.logeco.it/
5.3) Contact for further details	Andrea Campagna andrea.campagna@uniroma1.it CTL - Centro di ricerca per il Trasporto e la Logistica Sapienza Università di Roma Via Eudossiana 18 - 00184 Roma Phone +39.0644585136 UNINDUSTRIA Dr. Marco Galluzzo Via Andrea Noale, 206 - 00155 Roma, Italia Phone +39 06 844991 F +39 06 8542577 info@un-industria.it
5.4) Date of review	12/08/2014

5.5) Pictures

Figure 12: Map of Logeco delivery area and transhipment point

Figure 13: Logeco vehicle and IT concept

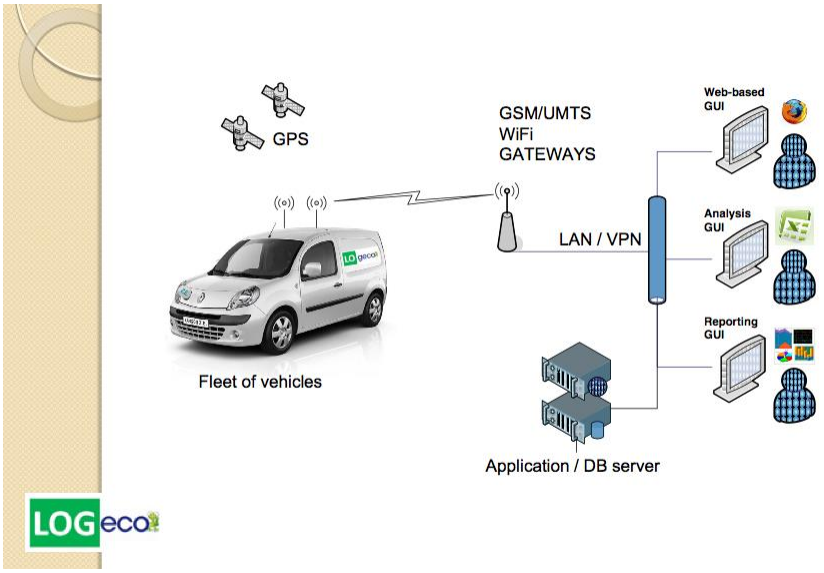
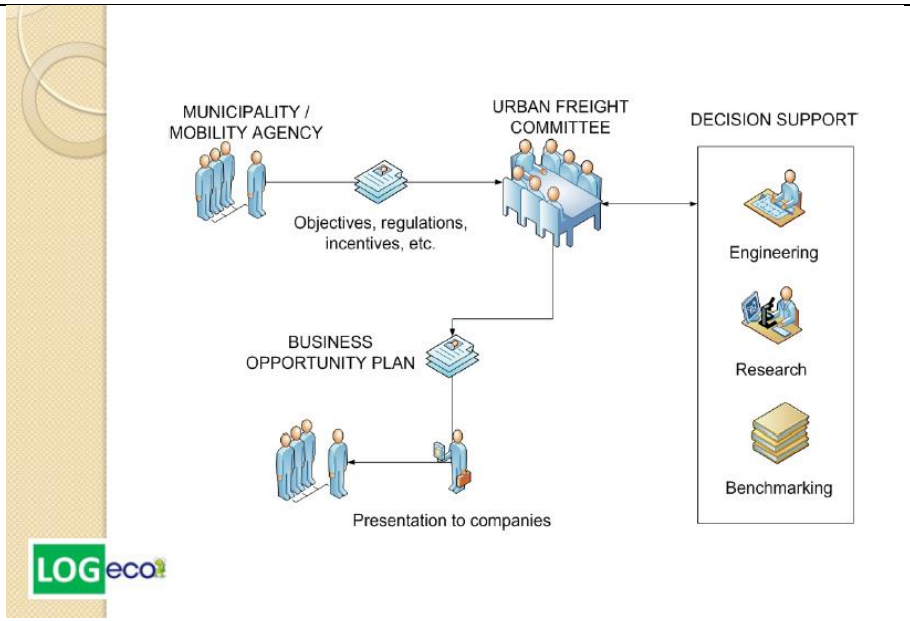


Figure 14: Logeco governance model

	
5.6) Involvement of SME	SMEs are involved in the logistics chain model of the case as well as the end beneficiaries. SMEs are involved in the planning and decision-making process as well as users/beneficiaries.
5.7) Impact on SME	SMEs can benefit of the opportunity the city logistics solution can bring (reduced cost of logistics infrastructure, reduced cost of last-mile third party delivery, avoidance of the cost of the permit for the central area, etc.) but only in case they are available to re-align their supply chain, meaning a change in the distribution practices in order to optimize the channel according to the solution (e.g. UCC, transit point, access regulation).
5.8) Opportunities for SME	The SMEs are involved directly (as shippers, loaders, developers and as stakeholders in decision-making process) and well as indirectly as end beneficiaries.

3.6 Electric Removal Truck, Aad de Wit Verhuizingen

Basic information	
1.1) Identification	Electric Removal Truck, Aad de Wit Verhuizingen
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible authors	Mobycon (Jaap Sytsma, Ronald Jorna)
Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.

2.2) Actor classification	Moving company
2.3) Geographical Area	The Netherlands, Amsterdam
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	The first full electric truck was introduced in 2011. Now, 53% of the company's fleet consists of electric vehicles.
2.5) Date of implementation	October 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 …
	Aad de Wit uses 2 electric trucks, 1 hybrid Volvo v60, 4 electric Renault Kangoo's, 1 Nissan E-NV200 electric van, 1 Elmoto electric scooter and 1 EEEEfun electric scooter.
2.9) Supply chain elements	Removals from one address to the other by electric truck in the area of Amsterdam. Aad de Wit has equipment for relocation, as well as for the storage of household goods and archives.
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)…

Best practice	
3.1) Description of the practice	Aad de Wit uses now two full electric trucks for removals. Hereby, the company fulfils current and coming environmental rules and regulations implemented in Amsterdam. The company offers now a zero-emission furniture removal service in the city, but in fact they can offer it country-wide. The electricity used by the trucks is 100% green energy (solar and wind energy). Besides, the trucks are more silent compared to conventional removal trucks. Removals by Aad de Wit can be done in a clean and quiet manner.

3.2) Technical main characteristics	What are the technical main characteristics? The first electric truck Aad de Wit purchased in 2011 had a range of 150 kilometres, based on a 120 kWh battery. The second truck they bought (2014) has a range of 250 kilometres and uses a 200 kWh battery.
3.3) Success factors	What are the main success factors of the practice? Why does it work so well? Relative short distances in the greater Amsterdam area that perfectly meets the capabilities of electric trucks.
3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • *Financial benefits?* - Lower operational costs • *Economic benefits?* - Better image - Expensive unique selling point for large sustainable (governmental) tenders and companies that want to show their sustainability. • *Benefits in the field of services?* • *Benefits for the society?* - Silent trucks • *Environmental benefits, expressed in CO2 or CO2equivalent?* - Limited CO2 emissions and climate change • *Other signs/indicators of success?* - Aad de Wit Verhuizingen won the Transport en Logistiek Nederland (TLN) 2012 award for extreme sustainable business operation. - Electric removal services are offered with the registered trademark “Verhuis Elektrisch” (Remove Electric). Please provide when possible relatable measures, units and the relevant calculation base.
3.5) Cost indication	2011 Electric AGV truck (12t GVW, 37 cbm capacity, 120 kWh, 150 km range): 180,000 euros. Normal diesel truck: 45,000 euros. 2014 Electric Hytruck (12t GVW, 49 cbm capacity, 200 kWh, 250 km range): 284,000 euros. Normal diesel truck: 45,000 euros.
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed? An electric truck is about 4 times as expensive as a normal truck. Therefore the company got financial support from Stichting DOEN and energy supplier Greenchoice to buy the first truck. The second truck was part of the Proeftuinproject Elektrisch Rijden from the Rijksdienst voor Ondernemend Nederland (www.rvo.nl). The government paid a part of the additional costs for the electric truck. The operational costs are slightly lower though not enough to pay back the higher investment costs.

3.7) Common practice before implementation	The company as well as it competitors used conventional fuelled removal trucks.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice? Aad de Wit wants to stand out as a frontrunner in the area of sustainability in its industry. First they offered CO_2 compensation but as this became a standard, they looked for new opportunities to show their Corporate Social Responsibility. In 2008 Aad de Wit Removals introduced CO_2 neutral removals, now this is the standard for the industry association of Erkende Verhuizers (OEV). Also the electric trucks help to overcome rules and regulations mentioned to limit negative environmental effects in the city of Amsterdam.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? It is the first (Dutch) removal company that uses full electric trucks whereas it seems rather logic to use electric trucks for removals, as distances are often short enough to use these trucks. Besides, it can be transferred easily to other cities and countries.
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, though financial support is important to overcome the high purchase costs.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	All sectors where distances are limited can use electric trucks.
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
	Financial support is important because of the high investment costs. On the other hand, strict environmental regulations can support companies to consider the purchase of an electric truck.
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

	All areas and cities where removals are done on not too long distances can facilitate electric removal trucks. And because of the still increasing capacity of the batteries, range limitations are decreasing in importance.
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. There are no similar companies known who offer electric transport at the same scale at their business operation. However, there is a new company in Amsterdam 'Taxi Electric' that from the start only uses electric taxi. Aad de Wit tries to promote electric mobility actively. It is the only end-user that is member of the industry association for electric mobility (DOET). As part of the initiative of 'MKB test elektrisch' (SME tests electric), Aad de Wit offered several Amsterdam SME to use an electric car. Aad de Wit also stimulates other removal companies to use electric trucks. Now two companies (one in Amsterdam, one in The Hague) decided to buy an electric truck.
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 Dutch removal company with electric trucks. Aad de Wit Verhuizingen is expecting to replace its full fleet with electric trucks in the coming years.
5.2) References	http://www.aaddewit.nl/mondial-aad-de-wit-verhuizingen-kiest-als-eerste-voor-elektrische-verhuisauto/ http://www.aaddewit.nl/mondial-aad-de-wit-blij-met-laadpaal/ http://greeneconet.eu/node/124 http://greeneconet.eu/zero-emission-furniture-removal-service www.youtube.com/watch?v=zFNAdDDK3mY http://www.noordhollandsdagblad.nl/stadstreek/kennemerland/article11812751.ece/Elektrische-verhuisauto-onthuld-in-Castricum-(video)?tabPane=Comments
5.3) Contact for further details	Aad de Wit Verhuizingen B.V. Postbus 313, 1900 AH, Castricum, The Netherlands, call: +31(0)251 652439. Contact person: Jan Laan, email: janlaan@aaddewit.nl
5.4) Date of review	Latest date of update of this format (06/10/2014)

5.5) Pictures	**Figure 15: Fleet of clean vehicles of Aad de Wit** 
5.6) Involvement of SME	Aad de Wit Verhuizingen B.V. is an SME with approximately 20 employees.
5.7) Impact on SME	There is no specific impact of using electric trucks for SME furniture movers. Maybe access to capital to finance the expensive electric trucks is more challenging for SMEs than for larger companies.
5.8) Opportunities for SMEs	Other SMEs could start a similar business in other cities and other countries.

3.7 Mokum Mariteam

Basic information	
1.1) Identification	Mokum Mariteam (set up by Icova and Koninklijke Saan)
1.2) Cluster	1 (urban freight)
1.3) Responsible authors	Mobycon (Jaap Sytsma, Ronald Jorna)

Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transport industry, shipping companies, municipality
2.3) Geographical Area	The Netherlands, Amsterdam
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	Mokum Mariteam started in 2007 and is still running, in 2010 the ship was used for the first time.
2.5) Date of implementation	2007/2010
2.6) Link to other clusters	• Are there existing connections to another cluster topic? Yes, Cluster 2: green logistics and co-modality • 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, infra-structure ☐ 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 …
	The cargo is delivered by a 20 meter long full-electric ship on the canals of Amsterdam. This ship is also used for reversed logistics. For transport to and from the ship, a small electric truck is used.
2.9) Supply chain elements	What other elements of the supply chain are involved in the practice? (e.g. terminals, warehouses, transhipment platforms etc.) Scaffolds, pontoons, warehouses, transport, reversed logistics, urban logistics, services
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: …
	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)…
Best practice	
3.1) Description of the practice	Mokum Mariteam uses the canals of Amsterdam to transport goods and deliver services. Hereby it reduces the number of small- and medium-sized trucks in the inner-city. The ships are driven by silent and clean electric engines. Goods are transported through the city and delivered at its destination without noise pollution. Using existing transport units like rolling containers, pallets and mesh containers, the system can be implemented by new clients and partners without any problems. This makes it possible to scale up the system gradually. Returned goods like waste and residues are transported from the place of use in the same efficient and sustainable manner. This system of reversed logistics increases the efficiency of the distribution concept considerably.
3.2) Technical main characteristics	The vessel is 20 meters long, 4.25 meters wide. It has space for 85 m^3 of cargo. A full-electric engine drives it. It has a hydraulic crane, with its own hydraulic power pack, driven by the batteries.
3.3) Success factors	• Better use of the available infrastructure in Amsterdam • Reduction of trucks in the city centre • Reversed logistics reduces the number of vans even further • Involved organisations see the advantages of sustainable transport by ship
3.4) Main benefits	• Financial benefits: - The main benefit is the contribution to the image of the companies - Bulk goods are a bit cheaper to transport, caused by lower number of vehicles that is needed. • Economic benefits: • Benefits in the field of services: • Benefits for the society: - Limited number of accidents on the road - Decrease in damage to the quay, caused by trucks • Environmental benefits, expressed in CO_2 or CO_2 equivalent: - Reduced emissions - Reduced noise pollution - Energy savings - Sustainable transport system - Less restrictions caused by time windows
3.5) Cost indication	The ship costs €900,000. Hiring the ship costs €125-150 per hour
3.6) Barriers / Limitations	The mind-set from the transport companies needs to be changed. Transport over water must become part of the general way of thought of the transport planners. Because it is unknown, it is unknown. Transport by ship gives additional costs but these can be reduced if transport is clustered.

3.7) Common practice before implementation	Trucks driven by engines running on conventional fuels mainly did transport in Amsterdam's city centre. They used busy roads, reducing the quality of life in the streets.
3.8) Motivation/problem	Overcrowded streets, partly caused by trucks as well as high levels of air pollution. On the streets in Amsterdam are also many incidents where accidents are just missed by luck.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? The approach of Mokum Mariteam is innovative and addresses both business and policy objectives. It is feasible and technologically mature. It has a high beneficial impact as it reduces emissions and truck distance in city centre area. It can also be transferred to other companies or other cities.
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)? The city should have canals/rivers and companies located close to them.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☐ Yes ■ No
	It focuses already on a wide variety of services that were previously done by trucks or cranes.
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
	It should be possible to transport goods on the canals and ships should be allowed to moor wherever it is needed. Furthermore restrictions for regular trucks/vans (e.g. time windows, size, load factor) make distribution of goods by ship more competitive. Also there needs to be space to unload the ship: parking facilities etc. prevent this sometimes.
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 ship has been built for short distances in the city. However, other cities with canals could use this solution as well.

4.5) Similar cases	Similar cases exist, such as the beer boat and eco-boat in Utrecht (but only for one purpose), and parcel distribution with ship and e-cargobikes in Paris.
Additional information	
5.1) Considera-tion for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	It is a very innovative case and it should be possible to transfer it to other cities.
5.2) References	www.mokummariteam.nl
5.3) Contact for further details	Willem Post, w.post@mokummariteam.nl, +31 6 21593011
5.4) Date of re-view	6 November 2014
5.5) Pictures	**Figure 16: Concept of Mokum Mariteam** 
5.6) Involvement of SME	SME's can hire Mokum Mariteam to get their deliveries to the places they need. Hotels are the main SME's that hire Mokum Mariteam.
5.7) Impact on SME	Mokum Mariteam helps to get an image of sustainability as well as it helps with reaching their CSR goals. If these SME's grow, it is likely they will hire Mokum Mariteam more often.
5.8) Opportuni-ties for SME	SMEs in Amsterdam can become clients and users of the new clean freight vessel.

3.8 Combipakt

Basic information	
1.1) Identification	Combipakt
1.2) Cluster	Urban freight
1.3) Responsible authors	Mobycon (Jaap Sytsma, Ronald Jorna)
Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transport, taxi, pharmacy, education, traffic school
2.3) Geographical Area	From which country (and city) does the practice originate? Netherlands, Nijmegen
2.4a) Size of city	☐ Large: >1 million inhabitants ☒ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	The project got a subsidy that was granted in 2013
2.5) Date of implementation	What year (or more specific date if possible) was the new solution implemented? 2014
2.6) Link to other clusters	• Are there existing connections to another cluster topic? *Yes, green logistics and co-modality* • 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***

<table>
<tr><td></td><td>
■ 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, infra-structure
☐ 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
</td></tr>
<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: taxi
</td></tr>
<tr><td></td><td>Medicines and agricultural products will be delivered by a taxi company and a traffic school from the city of Nijmegen to surrounding villages.</td></tr>
<tr><td>2.9) Supply chain elements</td><td>What other elements of the supply chain are involved in the practice? (e.g. terminals, warehouses, transhipment platforms etc.)
Transport, Warehouse, Transhipment</td></tr>
<tr><td>2.10) Which targets can be supported by the implementation?</td><td>
<table>
<tr>
<td>For public actors:
■ Efficient public spending
■ Ideal utilisation of infrastructure
☐ Competitive logistics and transport system
☐ Acceptance and influence
■ Balanced provision of goods and services
☐ Increased amenity value
☐ Highest safety and security
☐ Others</td>
<td>For private actors:
■ Increased efficiency / productivity of logistics processes
■ Increased company profitability
☐ Minimisation of financial risks
☐ Increased competitiveness
☐ Increased quality
■ Image
☐ Increased safety and security
☐ Others</td>
</tr>
<tr><td colspan="2">For both actor groups:
■ Limited climate change
■ Reduced emissions
■ Conservation of resources
☐ Others? Please specify: …</td></tr>
<tr><td colspan="2">Please specify all other and different targets here…</td></tr>
</table>
</td></tr>
</table>

2.11) End-user benefits	Where do end-users benefit? ☐ Affordable services (e.g. new affordable services or price reductions) ■ Services in rural areas (new/additional service areas) ■ Quality of services ☐ Reduced congestions ■ Reduced emissions ■ Reduced climate change ☐ Reduced noise pollution ☐ Implementation degree ■ High level of acceptance of solution/practice ☐ Other benefits: (please specify)…
Best practice	
3.1) Description of the practice	Please provide a description of the solution, give details about the **purpose** and the **sustainability objectives**. A taxi company for special target groups and patient transport and a traffic school delivers medicines from the city of Nijmegen to rural villages and houses in the surroundings of the city. On their way back to Nijmegen they pick up agricultural products from small farms and bring these to the city. Both the taxi company and the traffic school do this together with their usual business. This reduces the number of cars/vans in the city of Nijmegen as well as it increases the level of services in rural areas. At the same time a 100% transition from conventional fuelled vehicles to electric vehicles takes place.
3.2) Technical main characteristics	What are the technical main characteristics? Electric vans and cars.
3.3) Success factors	What are the main success factors of the practice? Why does it work so well? Combined transport of goods and people
3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • Financial benefits? • Economic benefits? - Transport of goods and passengers are brought together • Benefits in the field of services? - Higher level of services in rural areas • Benefits for the society? - Higher level of services, lower emission rates, lower costs • Environmental benefits, expressed in CO2 or CO2equivalent? - Reduction of emissions in the city and rural areas • Other signs/indicators of success? Please provide when possible relatable measures, units and the relevant calculation base.
3.5) Cost indication	If available, give indication of costs

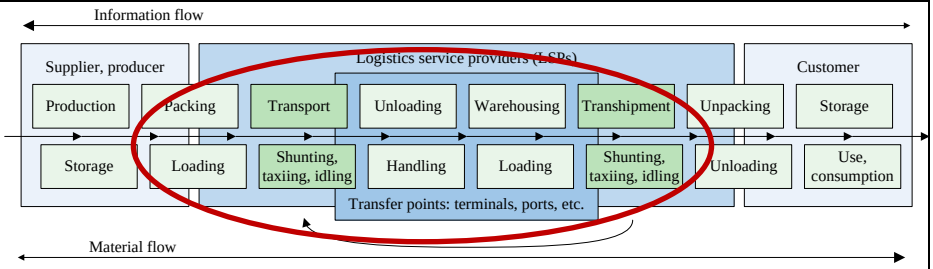
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed?
3.7) Common practice before implementation	Please specify what the common practice was before the implementation. Before, passenger transport, traffic school lessons and the delivery of medicines and goods were done all separately.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice? A low level of services in rural areas as well as empty vehicles returning from the rural areas to the city.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? The approach is innovative, as several services/commercial products are combined. There is a public and private interest. The data are partly available. The estimated impacts are beneficial.
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
	Please give a reason for your evaluation Several products/services can be combined on their way from the city to rural areas and back.
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 Combining commercial transport of passengers and freight is not always allowed in all countries. Often there is different regulation for freight transport and passenger transport.
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 system can also be used in different cities as long as there is a need for services and the delivery of products in a city and the surrounding area.
4.5) Similar cases	Not in the Netherlands
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 Interesting new and innovative approach, but too recently started.
5.2) References	http://degroenehub.nl/project/cooperatieve-combipakt-ua/
5.3) Contact	
5.4) Date of review	21 November 2014
5.5) Pictures	**Figure 17: Combipakt uses a Smith electric truck in Nijmegen** 
5.6) Involvement of SME	Combipakt is an initiative supported by private and public sector. No independent SME is involved
5.7) Impact on SME	Not available at this stage
5.8) Opportunities for SME	Not available

3.9 Citylogistik-kbh – City Logistics in Copenhagen introducing a UCC

Basic information	
1.1) Identification	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

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
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
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 frame-

	works ☒ 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.
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 competitive 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.
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).
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒Yes ☐ No
	The approach and the solution are transferable. There is a high potential for further development and applications to other cities.
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	18.10.2014
5.5) Pictures	

	 
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 3rd year of the 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.
5.8) Opportunities for SMEs	As developer of similar solutions, an SME can be starting such a consolidation centre and distribution service. As user of the service, SME such as shop can benefit from the close proximity of the depot and it quick reactivity.

3.10 Parcel and small cargo delivery using interurban bus system (KAUTRA)

Basic information	
1.1) Identification	Parcel and small cargo delivery using interurban bus system (KAUTRA)
1.2) Cluster	Cluster 1, Urban distribution
1.3) Responsible authors	Andrius Jaržemskis, Vilnius Gediminas technical university
Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Small parcel delivery service, private company, customers
2.3) Geographical Area	Original solution
2.4a) Type of city	☐ Large: >1 million inhabitants ☒ Intermediate: 50,000 to 1 million ☒ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	There are no examples of similar service in other countries, therefore it is unique best practice
2.5) Date of implementation	There is no exact date of implementation. Service was improved and developed for decades to the current state of the art.
2.6) Link to other clusters	Possible links to 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, infra-structure ☐ 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: Road/passenger bus
	Parcels and small cargo is delivered using interurban passenger busses
2.9) Supply chain elements	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 ☐ 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: …
	Please specify all other and different targets here…
Best practice	
3.1) Description of the practice	Purpose of the service is to deliver parcels and small cargo from any KAUTRA served city or town to another city or town that is also served by KAUTRA interurban busses in no more than 24 hours. Parcel and small cargo is delivered using interurban buses. The most of the parcels and cargo are delivered the same day or it takes as long as it takes for the bus to go between origin and destination. Parcels and small cargo may be dropped off in designated terminals or

	directly to the driver of the bus if there is no terminal in the city. People were always looking for a quick, reliable and easy way to quickly ship personal parcels (e.g. documents, purchases) between cities. Lithuania has well developed interurban bus system and people kept asking whether personal parcels could be delivered to their recipients in other town by giving it to the bus driver. It was made to official service due to natural demand. Parcels and small cargo (dimensions are limited or additional fee applies) are dropped off straight to the bus or parcel terminal if there is one in the station. Other shipping options existed at the time and they still exist (post service, couriers) however these mostly offer next day delivery and same day delivery is premium, expensive feature. Purpose of the service is to deliver parcel as quickly as possible with minimal risk of it getting lost via very simple system (no need to print out any codes, stickers or other additional effort to ship a parcel). Implementation of service required training drivers, no additional changes to the busses were necessary, as they come pre-equipped with baggage storages. To make service more convenient for the users, bus stations with the most frequent service use were equipped with terminal where parcels may be dropped off to be delivered to a specific bus and to be stored to be claimed later. In the cases when there is no terminal, the sender and recipient have to visit the bus they want to use for the delivery by themselves. Originally, service was not created to increase sustainability; however it contributes to reducing number of vehicles in the road, better vehicle use efficiency.
3.2) Technical main characteristics	Service is available in any town or city served by KAUTRA interurban busses. Larger stations are equipped with dedicated terminals where parcels can be dropped off or claimed. No modifications for busses are necessary.
3.3) Success factors	• Service is one of the fastest ways to deliver a parcel or small cargo and delivery time is very predictable, service is reliable; • Wide geographical coverage – parcels can be dropped off and claimed in any location served by KAUTRA company (nearly all towns of Lithuania); • Affordable price – integrating parcel delivery as an additional service saves shipment costs.
3.4) Main benefits	Increased efficiency/productivity of logistics processes; Increased company profitability; Increased competitiveness; Reduced emissions; Reduced resource use.
3.5) Cost indication	No additional cost to modify busses, investment in terminals located in the bus stations is undisclosed.
3.6) Barriers / Limi-	The main barriers were related to parcel drop off and claiming rules:

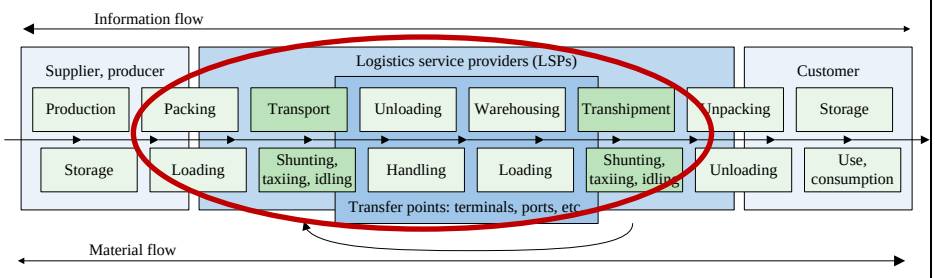
tations	as busses are run to meet schedules, it is not possible to wait for customers to drop off or claim package if station is not equipped with dedicated terminal. Development of the rules that would benefit both users and the company was the biggest challenge.
3.7) Common practice before implementation	The concept of the service was Sometimes parcels were accepted unofficially by asking the driver for a favour.
3.8) Motivation/problem	Customers kept asking drivers to deliver something. This type of service was illegal and had no clear rules (e.g. responsibilities and customer rights)
3.9) Justification of practice	This case displays example of successful innovative solution, which is transferable to other markets as well.
Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	The country, region or city has to have well developed interurban bus network for the geographical coverage.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	It could work with other modes of passenger transport that have a network and schedules.
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 case does not require any changes in political framework
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 depends on geographical coverage and would work in any network with sufficient number of stops to cover needs of the most customers.
4.5) Similar cases	Other companies implemented similar solutions, however no significant changes were made.
Additional information	
5.1) Consideration for in-depth	Should this case be further considered for in-depth review? ☒ Yes ☐ No

analysis	Innovative mix of a passenger and freight transport service.
5.2) References	http://www.siuntosautobusais.lt/ (Lithuanian language only)
5.3) Contact for further details	-
5.4) Date of review	10/10/2014
5.5) Pictures	**Figure 18: The KAUTRA brand logo**  **Figure 19: KAUTRA terminals (marked with S) and other partner cities**  **Figure 20: KAUTRA Bus** 
5.6) Involvement of SME	-

5.7) Impact on SME	SME can use the service for quick and cheap same day delivery of their goods

3.11 Delivery to a C&A store in Berlin with low-noise electric trucks of Meyer&Meyer

Basic information	
1.1) Identification	Delivery to a C&A store in Berlin with low-noise electric trucks of Meyer&Meyer
1.2) Cluster	CL 1 – Urban Freight
1.3) Responsible authors	Philipp Lenz, PTV
Scope of practice	
2.1) Approach	☒ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Logistics service providers, retailers, vehicle builder
2.3) Geographical Area	Berlin, Germany
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	Since May 2011 two trucks are in use. They are delivering to the C&A-store at Kurfürstendamm in the inner city of Berlin, starting from their logistics centre in Potsdam-Fahrland.
2.5) Date of implementation	May 2011
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	
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: …potential of rules and regulations
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: ....
Best practice	
3.1) Description of the practice	Meyer&Meyer is a third-party logistics provider from Osnabrück in Germany who supplies primarily retailers in the textile industry. To increase their corporate image, test the usage of electro mobility and develop concepts to increase the profitability of electro trucks, Meyer&Meyer started a pilot in which the C&A sore (Kurfürstendamm) is being delivered by an electric vehicle. For this purpose they developed a vehicle concept for 12t-trucks in cooperation with the Dutch vehicle builder where existing standard diesel-powered vehicles are modified with an electric engine. The solution has been supported by two research projects, “Nanu” and “E-City-Logistik”, both coordinated by the Fraunhofer IPK.
3.2) Technical main characteristics	The trucks that are used in this solution are MAN TGL diesel trucks that are converted into electro trucks by a company called All Green Vehicles (AGV) near Groningen in the Netherlands. AGV changed the diesel engine, transmission and cooling system against a battery and the technology of the electric drive with 120kW. The range is between 165 and 200km. The weight of the truck increases by 700kg. In Berlin, the trucks’ batteries need to be charged every 170km for 12 hours. The captive electric charging station is solely provided with green electricity. A similar truck is currently being used by a Dutch bank. All information about the usage of the trucks are analysed by the Fraunhofer IPK during the test.
3.3) Success factors	
3.4) Main benefits	<u>For retailers</u>: • Corporate image <u>For transport companies</u>: • Testing the profitability of the usage of electric vehicles • Experience in the usage of electric vehicles

	• Discussion with municipalities about privileges for electric delivery vans • Function as pioneer and good reputation For the city and their inhabitants: • Reduction in noise and pollution in the inner city
3.5) Cost indication	The costs of the modification of the two e-trucks were about half a million euros. Although it is cheaper to charge an electric truck than to fuel a standard diesel-powered truck, the acquisition costs of an e-truck are much higher than the ones of a normal truck. To substitute a standard diesel-powered truck, an e-truck has to accomplish 250km a day. But at the moment their range only amounts to 170km.
3.6) Barriers / Limitations	• At the moment, e-trucks do not pay off in the test because of the high acquisition costs. Public subsidies are necessary • 170km range, 250km necessary for profitable use • 12h charging time • Hardly any vehicle builder supports such projects (problem to get vehicles above 12-tons)
3.7) Common practice before implementation	Before the project, Meyer&Meyer used standard diesel-powered trucks.
3.8) Motivation/problem	Meyer&Meyer wants to make a first step towards the usage of electro mobility and test ways to reach their corporate target of a reduction of CO_2-emissions of about 20% until 2020. Access regulations to inner cities and agglomerations are already strict and will become even stricter in the future. Meyer&Meyer wants to assess the potential of electro mobility in close combination with a range of regulatory policy instruments.
3.9) Justification of practice	This case demonstrates the feasibility of the full-electric technology for inner city deliveries if the average distance travelled increases from 170km to 250km per truck. This calculation will improve as soon as the production costs of the vehicle decrease.
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. A problem could be 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, so it's not limited to the textile industry.

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
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
	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 possible, e.g. well located parking spaces, longer access times in pedestrian zones, sharing of taxi-ranks and usage of bus lanes.
4.5) Similar cases	UPS in Karlsruhe

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://www.meyermeyer.de/pressemeldungen.html?action=viewNews&news_id=19&element_id=343&category_id=1 http://www.eurotransport.de/news/der-logistikdienstleister-meyer-meyer-mit-dem-gespuer-fuer-mode-und-sauberkeit-6471738.html http://www.allgreenvehicles.nl/ http://youtu.be/Nqoq-ob2QvU (Video)
5.3) Contact for further details	
5.4) Date of review	18.11.2014

5.5) Pictures	**Figure 21: Electric lorry of Meyer&Meyer** 
5.6) Involvement of SME	No SME participation.
5.7) Impact on SME	Not given
5.8) Opportunities for SMEs	Other SMEs could also test the feasibility of using an electric truck for urban deliveries.

4 In-depth reviews

4.1 La Petite Reine: Supermarket Home Delivery Services by e-bikes

Basic information	
1.1) Identification	La Petite Reine: Supermarket Home Delivery Services by e-bikes
1.2) Cluster	CL1 city logistics
1.3) Responsible authors	Christophe Rizet – Ifsttar (Christophe.Rizet@Ifsttar.fr)
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. La Petite Reine is a company home delivering purchases from the stores with electrically assisted *Cargocycles*® and electric vehicles
2.3) Geographical Area	The practice originates from Paris (France)
2.4) Implementation status	Please indicate and explain the status of the case you describe. ☐ Evolving Best Practice ☒ Best Practice
	The activity of La Petite Reine has changed since its creation but it is now stabilized.
2.5) Date of implementation	La Petite Reine was first implemented in Paris in 2001
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 …
	The vehicles are electrically assisted tricycles (*Cargocycles®)* and electric vans
2.9) Supply chain elements	La Petite Reine is delivering purchases from the retail stores to private home, after the consumer has bought it in stores. The company also needs a place to park its electric vehicles at night in the city centre near the stores it serves.
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 (insertion, employment) *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, 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)…
Best practice	
3.1) Description of the practice	Please provide a description of the solution, give details about the **purpose** and the **sustainability objectives**. La Petite Reine is based on a new concept of vehicle: the *Cargocycles*®, an electrically assisted tricycle adapted for the last mile delivery (new in 2001 and now widely spread). It started in Paris in 2001 as a last mile operator for messengers ; Considering the possibility to offer delivery driver jobs, it was bought by an insertion association (ARES) in 2009. Now 30% of the delivery drivers have been 'included in the job market' : people who had difficulties finding a job, who are advised by a coach and generally benefit from a training. The extra cost of insertion like the coaching and training is supported by ARES, independently of La Petite Reine Budget. In 2011, Star's Service entered in the capital of La Petite Reine at 51% and the company reoriented its activity, from parcels distribution to home delivery for retailers: it benefited from the Star's Service network, a French leader of shopping home delivery. It now provides home delivery services from large store in Paris. Its clients are the large retailers (Monoprix, BHV, Carrefour, …)
3.2) Technical main characteristics	La Petite Reine is using two types of electric vehicles : electric vans and electrically-assisted cargo tricycles, Cargocycles® have been designed by la Petite Reine and manufactured in France by Lovelo (http://www.lovelo.com). They have a volume of 1.5 m³, an empty weight of 80 kg and a capacity of 100 kg. They can load ice to keep the products cool. The electric assistance motor is a 250 W; it has been designed for the Cargocycles® to be classified as a cycle and authorized to use cycle lanes. Each cycle is using two batteries and each battery has an autonomy time of approximately 2 hours of work. The deliveries made by the tricycles are generally in a ring of less than 1km from the store. Longer trips are delivered by the electric vans which have an autonomy range of 80 km. Electric vans are Kangoo ZE from the French manufacturer Renault. These vehicles have an autonomy range of 80 km and are equipped with a fridge. They need one night to charge the battery.
3.3) Success factors	This company is mixing a clean business with social insertion.

3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • *Financial benefits?* In 2013, the company's budget was balanced after 4 years of losses. • *Economic benefits?* Insertion, congestion and environment • *Benefits in the field of services?* The consumers are delivered and do not need to take their car. • *Benefits for the society?* Inserted delivery drivers have contracts of 7 months up to 2 years .85% of them find a job or a qualifying training when the leave the company. In December 2014, 70 employees are employed at La Petite Reine. • *Environmental benefits, expressed in CO2 or CO2equivalent?* Hard to quantify because we don't know what proportion of consumer would take his car if he could not be delivered by La Petite Reine.
3.5) Cost indication	The main costs are labour (approximately 1,2 driver per cycle in use and 1,5 per van in use, plus management), parking and vehicle purchasing costs and maintenance (including batteries).
3.6) Barriers / Limitations	The main barrier is now the availability of a specific place to park electric vehicles. Municipalities could help to find such places.
3.7) Common practice before implementation	Home deliveries could be made by diesel vans, or there could be no home deliveries from the stores and, in this last case, the consumer could either come with his own car or take his purchase by foot.
3.8) Motivation/problem	The congestion linked with home deliveries and the oversizing of freight vehicles in towns.
3.9) Justification of practice	La Petite Reine is dealing with the 3 pillars of sustainable development : economic (the congestion issue), social (insertion) and environmental (emission and noise) This case has public and private relevance, is transferable, has a high beneficial impact on emission, and the data are available.

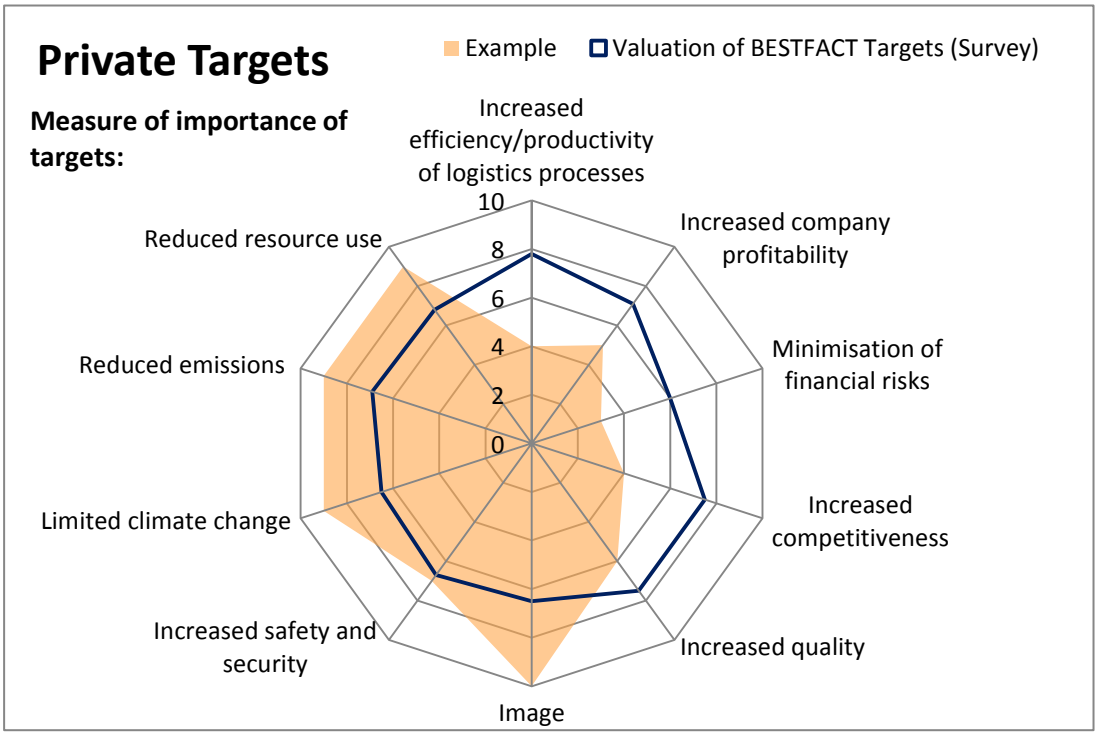
Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ☒ Yes ☐ No
	This solution is for large and dense area (where the customer can't easily take is car) and rather flat cities.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No

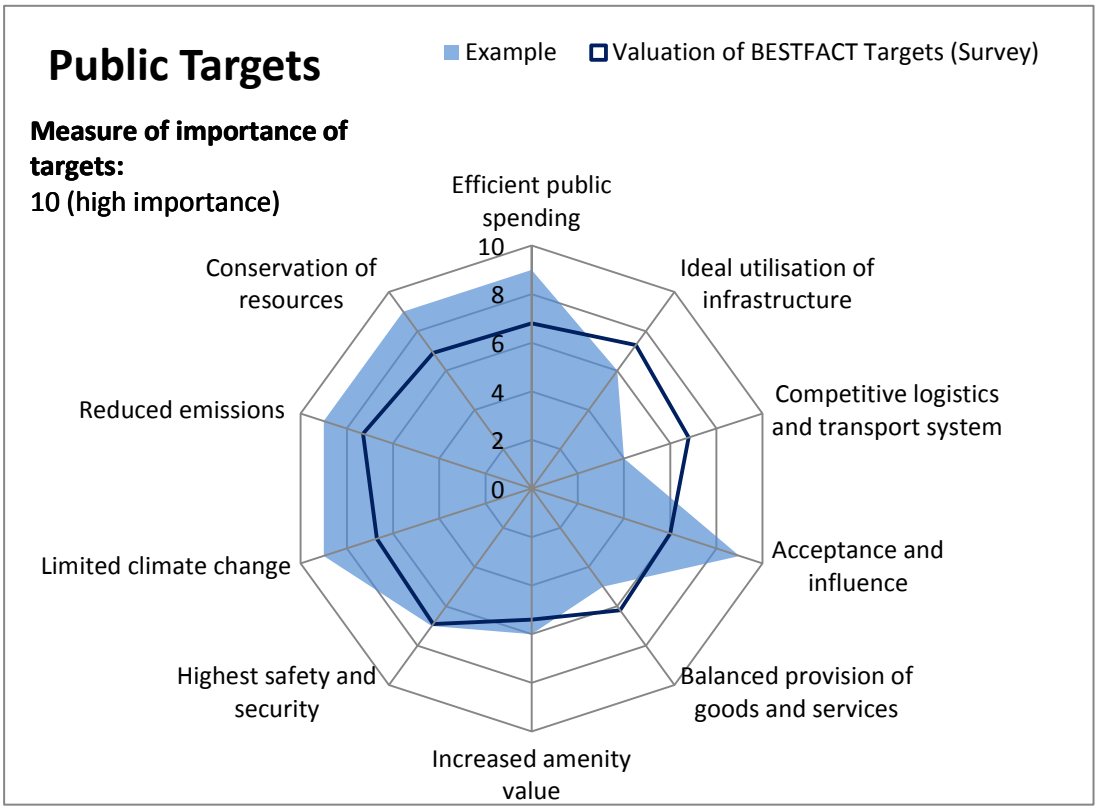
	La Petite Reine is trying to develop other activities.
4.3) Political framework conditions - Regulations	Are there political framework conditions and/or regulations for the best practice case that need to be in place or have to be considered for the transfer of the practice to another domain? ☒ Yes ☐ No
	The authorization to drive and stop in cycle lanes and pedestrian zones, and mainly an help to find a good and cheap parking place for electric vehicles.
4.4) Extensibility	Can the area of the solution be extended or can the practice be used within a different area (e.g. can a city specific solution be used nation wide?) ☐ Yes ☒ No
	This solution is not fitted for the countryside
4.5) Similar cases	The main specificity of La Petite Reine is its social insertion activity.
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Good potential, high impacts and benefits for public sector.
5.2) References	References and sources used to provide the given information *website : http://www.lapetitereine.com/fr/* *The site will be renewed soon (last check : 03/12/2014)*
5.3) Contact for further details	If personal contacts were established please provide the name, email and telephone number *Solenne de la VILLEON* *solenne.delavilleon@lapetitereine.com*
5.4) Date of review	Latest date of update of this format: 17/02/2014

5.5) Pictures	**Figure 22: Tricycles of La Petite Reine** 
5.6) Involvement of SME	La Petite Reine is an SME.
5.7) Impact on SME	No impact on other SMEs
5.8) Opportunities for SME	Any other SME in logistics can potentially develop a similar solution in another city and another country. For now only large retailers are clients of La Petite Reine.
In-depth information	
6.1) Costs	• What are the (estimated) costs (e.g. investments, operation) Labour costs: 40 delivery drivers are working per day, +16 Kangoo drivers . They are all employed on a full time basis and paid at the minimum legal salary (SMIG) ; 6 managers (2 platform agents, 2 team leaders and 2 coordinators), one operating manager, one mechanic, one commercial and development manager. Parking : electric vehicles must be parked in binding regulated places, because of the risks of batteries : no lower than the first underground, equipped with fire-doors and with a low density. The cost of the parking is 100 -150 € /m2/year, which means approximately 3000 € per vehicle per year and such parking is very difficult to find at this price. The vehicle purchase costs are 6500-8000 € /per tricycle and 12000€ per van (once deduced the 7000 € bonus subvention obtained for the purchase of an electric vehicle). Batteries are also costly and rather short term life cycle; there is a lack of long term visibility on the technology. • What financing is presently applied/planned (partnership, private,

	public funding) It is a private business.
6.2) Benefits / Strengths	• Cost-benefit ratio, cost per output unit, share of private investments In 2009, La Petite Reine had a € 1.8 million loss for a turnover of 2 million. In 2012, the turnover was 1.5 million and the loss only 0.1 million. In 2013 the balance in the budget was even. • Utilisation rate of networks, time losses The client of La Petite Reine is the retail store. The retailer manages the vehicle use. • Profits, debt The losses have been covered by the owners • Units per delivery, mileage per delivery, total mileage • Developed market size, market share The Company is currently trying to develop in Paris, including by spreading to other activities, and in other cities. • Frequency of service, access times to networks, accessibility • No. of accidents, no. of incidents with hazardous goods • CO_2 emissions, GHG emissions, emitted pollutants, noise immissions • Energy used, space used, sealed surface Energy, CO_2 and emissions are the clear advantages of this solution but they are difficult to quantify. • Other benefits? Social insertion is also something very useful to society.
6.3) Weaknesses	• What are the main weaknesses of the project, concept, strategy, initiative? • What are the main risks? • Are there undesired secondary or external effects?
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: … Which actors are relevant in the process?
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 it is ; the question is what is its (optimal) market share, taking account the physical characteristics of the Cargocycles® and electric vans.

Evaluation of strategic targets





4.2 EMILIA

1. Basic information	
1.1) Identification	EMILIA - Electric Mobility for Innovative Freight Logistics in Austria
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	ECONSULT Betriebsberatungsges.m.b.H.

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.
2.3) Geographical Area	From which country (and city) does the practice originate? Austria, various cities
2.4a) Type of city	☒ Large: >1 million inhabitants ☒ Intermediate: 50,000 to 1 million ☒ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	The project has been set-up in 2014 as a national flagship project to implement best practice test-beds for electric mobility in urban freight business cases.
2.5) Date of implementation	2014
2.6) Link to other clusters	-
2.7) Topics covered	Which topics are covered by the practice? ***Infrastructure and Technology*** ■ Access to transport networks, infrastructure and nodes ■ Freight consolidation and transhipment ■ Implementation of low emission technologies ■ IT-technologies and solutions (for management and administration) ■ Innovative vehicles, vessels and equipment ■ ICT (e.g. routing, guidance), transport optimisation ***Organisation and Cooperation*** ■ Business to business (B2B) solutions, cooperation ■ Competitive aspects: collaboration (cooperation with competitors), prioritisation (priorities on infrastructure and in nodes) ■ Communication between authorities: cooperation, procedures, legal frameworks ■ Communication between businesses and authorities: coordination, consultation ■ Business models: new form of ownership, risk management ***Operations and Services*** ■ Business to customer (B2C) solutions (e.g. e-commerce, last mile delivery) ■ Innovative operational solutions

	■ Value added services, development (or extension) of services ■ Service quality and sustainability agreements/certification ■ Transport management, fleet management ***Regulations and Policy*** ■ Access rules and restrictions of urban areas ■ Land use and spatial planning: assessment and siting of transport facilities and infrastructure ☐ Infrastructure financing: taxation, user charges, PPP ■ Environmental standards and policy ■ Interoperability and standardisation: vehicles, equipment, loading units, infra-structure ☐ 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 project covers mainly the elements and processes in the fist- and last-mile in urban freight distribution and collection of goods. In retail processes the final handling, cross-docking, transhipment, transport and distribution processes are considered. The focus of the project is on transport, in retail scenarios also the final handling and hub processes, cross-docking, transhipment and overall distribution strategy are considered.
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): Raised awareness of the possibilities and opportunities offered by e-mobility for freight logistics.
Best practice	
3.1) Description of the practice	The growing significance of city freight transport and logistics is related to increased and still increasing population in urban areas. The result is a rising demand for freight transport. Furthermore, as urban freight transport deals primarily with the distribution of goods at the user end of the supply chain, many deliveries tend to be made in small loads and in frequent trips, thus resulting in many vehicle kilometres. These developments seriously affect the environment of cities in terms of pollution, noise and CO_2 emissions. Politics had to react to these changes and started defining goals and taking measures to reduce emissions in urban centres. The project EMILIA focuses on these three major goals: ▪ The raising of awareness for the topic of e-mobility in urban logistics, ▪ the improvement of technologies to carry out transports in urban areas using ecologically friendly vehicles and ▪ the optimization of transport chains with novel logistics concepts, planning algorithms and applications In the first project part an open innovation process is started. The idea of open innovation is to open up the internal innovation process in order to increase the innovation potential and to develop a detailed understanding of the current environment. Representatives of logistics/delivery companies of the industries “food trade”, “goods delivery” and “service companies”, as well as OEMs (Original Equipment Manufacturer), vehicle suppliers (leasing associations) and opinion leaders in the field of transport and logistics, delivery business and e-mobility seized the opportunity to exchange their knowledge as well as their different points of view. Relevant key findings regarding business requirements, expectations and barriers for optimization strongly influence the results of the project. In the second project part three different prototypes of electric vehicles are developed: An electric cargo tricycle, an electric light utility vehicle and the EMF Citylog. The aim of reengineering these vehicles for urban logistics business cases is to achieve cost reductions through efficiency improvement, weight reduction and range extension. The vehicles are adapted and optimized to the requirements of different transport logistics providers. In a test-bed and during real life operation a simulation model for upscaling the effects of the pilot is developed and implemented. The third part comprises the development of novel and innovative freight logistics concepts for the supply of urban areas especially tailored towards a significant use of electric mobility. The logistics concepts focus mainly on operational feasibility, sustainability, and profitability. The concepts are evaluated by applying criteria such as ecological, economical and social impacts. The most promising concepts

	are selected for further consideration and the conception of roll-out scenarios. In a last step the results of the vehicle development are linked to the further elaborated freight logistics concepts. The developed research demonstrators are deployed, demonstrated, and evaluated in close collaboration with the application partners. It will be shown that there is a considerable potential for the usage of electric mobility in an urban logistics setting and that the well-planned usage of electric vehicles is economically viable while having a positive impact on the environment.
3.2) Technical main characteristics	▪ Open Innovation: An open innovation process supports the whole development and implementation phase of the project, providing internal and external Know-how-transfer between all stakeholders. ▪ Electric cargo tricycle: The goal is to realize an energy efficient and high performance powertrain for an electric cargo tricycle. The electric powertrain components shall be specified, optimized, realized and integrated into the chassis. One focus is on the design of a novel PM synchronous motor utilizing SMC components for the axial flux guiding. The other focus is on the design of the power electronic inverter including a new control system for the interaction of the electric drive and a continuous variable transmission (CVT). ▪ Electric light utility vehicle: The goal is the realization of an optimized electric powertrain for a light utility vehicle. Specific development goals are a 10% cost reduction and a 20% weight reduction for the electric motor, plus a 15% range extension for the EV. The electric powertrain components will be specified, optimized, realized and integrated into the chassis. ▪ EMF Citylog: The main innovations of HET's Citylog are the hydrogen hybrid drive, the lightweight structure and the new four wheel steering concept without any mechanical connection between the steering control (Joystick) and the wheels. With this steering concept all four wheels can be turned around ± 90° independently of each other by electric steering motors. ▪ Vehicle Simulation, Modelling and Identification: Simulation models of different vehicle types shall be implemented and developed in a simulation environment. These models will be validated and prepared to develop energy estimation algorithms which will be integrated into a routing application. The focus is to implement an entire vehicle simulation including auxiliaries in order to guarantee accurate routing. The different vehicle concepts contain all of the vehicle components that are relevant for the calculation of the energy consumption. ▪ Dynamic Operational Planning: Novel methods and applications for planning and managing the transport operations are developed for implementing the new logistics concepts. The developed applications will allow a priori planning as well as the real-time management of the delivery vehicles.

3.3) Success factors	The success of the project is due to the fact that a very broad consortium of 15 partners, employing around 100.000 people, and coming from different fields of economy, are partnering to set-up pilot scenarios for best practices. These companies with different goals and backgrounds work together on technological and organizational questions. Together they are in a position to check and evaluate the results with a combined fleet of about 1.500 vehicles, driving more than 64 million kilometres a year, offering an absolute annual CO_2 reduction of 12.571 to. Additionally to this bottom-up approach the partners decided to integrate further participants into the project by making it an open innovation initiative. Therefore an online tool has been established in order to be able to benefit from results of other projects as well as to exhibit the results of the project to a broad public, ensuring that the project receives the full attention of relevant target groups. The early stakeholder integration also ensures the raising of awareness and acceptance within potential customer groups.
3.4) Main benefits	Electric vehicles are more energy efficient, quieter and they produce significantly lower levels of CO_2 and air pollutants compared to standard vehicles. As a result the deployment of electric vehicles is an important measure in the reduction of emissions, especially in the context of urban freight transport solutions. As there is still room for improvement, technical as well as logistics optimizations (e.g. considering the loading times in optimizing supply chains) help to magnify these advantages of e-mobility even more. Furthermore, its use contributes to minimizing the dependence on fossil fuels in the future. Because of the above mentioned advantages (especially noise and air polluting emissions) electric vehicles can be permitted in times or areas which are usually restricted to transport activities. This fact improves the flexibility and productivity of the carriers and counteracts the effects of traffic jams (with their financial, economic and ecological disadvantages). Furthermore, research on improved and new intelligent technologies or organizational improvements helps to elevate the attractiveness of Austria for researchers and investors as an interesting economic and R&D-location. Electric mobility opens up entire new economic and societal opportunities: green tourism, novel vehicles with built-in fun factor, the ease of mobility for special user groups, and much more.[3]
3.5) Cost indication	n.A.
3.6) Barriers / Limitations	It cannot be denied that “currently the purchase price and total cost of ownership (TCO) for EFVs are significantly higher than for conventional vehicles”, especially because of high battery cost and limited production volumes. Moreover, the second hand market, as well as the residual value of EFVs, is not yet clearly known.[4] These facts together with a lack of experience in their use deter many logistics ser-

[3] http://www.ecoplus.at/en/ecoplus/cluster/e-mobility/about-initiative

[4] FREVUE D1.3 State of the art city logistics and EV, S. 2

	vice providers from investing in these vehicles. The particularities of the operation of electric vehicles raise various questions which often form too great a challenge (organization, planning, financing, maintenance, technique, legal questions, etc.) not only for small enterprises. Within the discussion about electric mobility criticism is being voiced regularly that the cost as well as the ecologic advantage of the technology is not determinable, as this is a question of the scope of the considerations. Without being able to solve this problem the project tries to define and coordinate all relevant aspects (technology, implementation field, etc.) and test the application in demonstration. This helps to draw a realistic picture of the implementation scenarios.
3.7) Common practice before implementation	Hardly any electric vehicles exist in the public perception for the delivery of goods in urban areas. Conventional cars which are hardly limited in the access to the city centres (exception: weekend and night access regulations) supply the individual customers. Parcel distributors have optimized their routes without cooperation with other service providers. The awareness of problems concerning freight transport in urban areas is only increasing within the scientific community and politics, but the public pressure for change is still rather low. No practical, big scale experience exists in Austria in the field of electric mobility for freight transportation in urban business scenarios.
3.8) Motivation/problem	Delivery of goods to urban areas is mostly organized individually by carriers authorized by retailers using standard vehicles. The common problems they have are empty runs, the decreasing degree of capacity utilisation, parking problems, traffic jams, restrictions in delivery times, etc., which directly influence their productivity as well as their competitiveness. On the other hand the political pressure is increasing, similar to arising problems in bigger European cities and due to proclaimed goals of the EU. So the necessity to find viable and sustainable solutions came from different directions, not necessarily solving actually existing problems, but being prepared for upcoming challenges in the future.
3.9) Justification of practice	The project is Austria's largest initiative for the implementation of electric vehicles for urban freight. It was nominated a flagship-project within the initiative "Austrian Electric Mobility Flagship Projects", supported by the Austrian Climate and Energy Fund and the Austrian Government. The project managed to bring various important stakeholders from different sectors with different backgrounds and numerous capabilities together to work on a common solution. Additionally a comprehensive range of dissemination activities is executed from the start to the end of the project, offering transparent information to the stakeholders and the public. Within the project essential research and inputs of experts are considered in the deployment phase. All theoretical results are verified by

	real-life demonstration scenarios and the evaluation process is conducted in close cooperation with the application partners, thus allowing for necessary process adaptations. The established project network and the results are expected to generate a high market response, leading to further pilot- and implementation cases and a rising demand for e-vehicles in the transportation and cargo logistics sector.
4. Transferability	
4.1) Geographical Area	Can the solution be transferred to other countries, regions or cities? ■ Yes ☐ No
	The project shows two results which are aligned with each other: the technical solution and the logistics concept. As the technical solution is based on three different vehicles (Electric Cargo Tricycle, Electric Light Utility Vehicle or EMF Citylog) there is a possibility for situational implementation scenarios depending on the specific requirements of the country, region or city. The design of the logistics concept takes into account the properties, advantages and limitations of electric mobility. It is especially tailored towards a significant use of electric cargo vehicles and shows that using electric vehicles in urban logistics is technically feasible and economically viable.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No
	The high number of different participants in this project, as well as the integration of different urban settings, covers a wide range of actors and/or industries even within the demonstration and evaluation phase.
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
	Although no political or regulatory barriers restrained the best practice case, it is without doubt that a modification of the restrictions for transport in urban areas would further stimulate the dissemination of the application.
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
	One of the goals of the Transport White Paper announced by the European Commission in 2011 is to “halve the use of ‘conventionally fuelled’ cars in urban transport by 2030; phase them out in cities by 2050”. EMILIA is dedicated to playing an important role in achieving this goal. Therefore it is planned that the concepts and technologies

	developed and tested in EMILIA will become essential parts of new supply chains and last mile solutions. EMILIA will also deliver results of e-mobility technology and logistics concepts, which will contribute to further implementation in other countries.
4.5) Similar cases	The particularity of this best practice project is the interlinkage of improved technology and novel logistics concepts. There are of course other similar cases within the EU, focussing on new technologies or intelligent concepts, but the linkage of the two approaches distinguishes EMILIA from other practices, and makes it a unique approach.
5. Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	As a national flagship project, the results of the conception and the demonstration phase will influence the further development of e-mobility in logistics. Politics and industrial stakeholders will both follow the results and they will deduce criteria for their further strategic decisions on e-mobility. The proof of the implementation and growth potential is one goal of the project, therefore the projections and prognosis of further development of urban freight is an important issue.
5.2) References	References and sources used to provide the given information http://www.austrian-mobile-power.at/ http://www.ait.ac.at/departments/mobility/
5.3) Contact for further details	Dipl.-Ing. Heimo Aichmaier Austrian Mobile Power www.austrian-mobile-power.at heimo.aichmaier@austrian-mobile-power.at Mag. Jürgen Schrampf ECONSULT Betriebsberatungsges.m.b.H www.econsult.at j.schrampf@econsult.at Mag. Boschidar Ganev, MSc. AIT Austrian Institute of Technology www.ait.ac.at boschidar.ganev@ait.ac.at List of all project partners: AIT Austrian Institute of Technology LKR Leichtmetallkompetenzzentrum Ranshofen (LKR) Clusterland Oberösterreich GmbH (AC OÖ) Austrian Mobile Power (AMP) Bitter GmbH (Bitter) DPD Direct Parcel Distribution Austria GmbH (DPD) ECONSULT Betriebsberatungsges.m.b.H Gebrüder Weiss Paketdienst Gesellschaft mbH (GWP) Gleam technologies GmbH (Gleam)

	HET Hochleistungs- Eisenbahn- und Transporttechnik Entwicklungs-GmbH (HET) Innovation Service Network GmbH (ISN) MAGNA STEYR Engineering AG & Co KG (MSE) Miba Sinter Austria GmbH (Miba) REWE International AG (REWE) Schachinger Immobilien und Dienstleistungs GmbH & Co KG (Schachinger) SIGNON Österreich GmbH (Signon)
5.4) Date of review	22.09.2014
5.5) Pictures	**Figure 23: Logo of EMILIA** EMILIA ELECTRIC MOBILITY FOR INNOVATIVE FREIGHT LOGISTICS IN AUSTRIA **Figure 24: Clean vehicles in EMILIA**  **Figure 25: Concept of EMILIA** 

5.6) Involvement of SME	There are various SME involved in the project and in the whole e-mobility market. Some companies developing new vehicles and prototypes are SME, as this market segment is actually not large enough for the big players. So the SMEs play an important role in pushing and promoting innovation in this sector.
5.7) Impact on SME	The impact on SME can differ, especially for those focussing on technology development. They either aim at making the step towards serial production and growing business or they try to cover niche markets or regional markets with tailor-made and customer-oriented productions (e.g. special vehicles that are converted or rebuilt for special industry sectors). In any case, the contact to potential customers within the pilot settings provides feedback and reveals requirements that need to be covered.
In-depth information	
6.1) Costs	The cost of electric mobility is decisive for its breakthrough and broadly discussed among experts and potential buyers of electric vehicles. One must distinguish between ▪ procurement cost and ▪ total cost of ownership. Procurement costs are considerably higher with electric vehicles. On the other hand the average maintenance costs are generally lower and electric vehicles are exempted from certain fees (depending on the particular statutory provisions). Concerning the prices of fuel/electricity, different expert statements can be found in numerous studies. Forecasts of the development of energy prices are based on often unforeseeable and dynamic factors, and as a result definitive assumptions are difficult to make.
6.2) Benefits / Strengths	The cost-benefit ratio is considered to be negative on a short-term basis but positive in the long-term. The discussion about further implementation steps has to be done in parallel with the discussion about the implementation of loading infrastructures for e-mobility. It can be regarded as an advantage that this topic is actually pushed by the private sector and by utilities and energy grid operators. As e-mobility for the private and the passenger sector (electric cars) has developed very positively in the last years, this can also have positive impact on business implementations, even if the technology in this sector is actually not ready for the market. Regarding the implementation of e-mobility in logistics, it is a goal to either achieve equal service and productivity levels compared to conventional vehicles, or to set up new business cases where pricing, restrictions etc. have to be considered. Currently, together with e-business and e-fulfilment, new services are being developed, and customers are more and more integrated in the decision making process concerning logistics solutions. It can be considered an opportunity that new services with new technology can now be developed together with integrated, market-oriented business solutions.

<table>
<tr><td>6.3) Weaknesses</td><td colspan="3">The added value of the project is the interaction between new technologies and novel logistics concepts. This combination provides an opportunity for promising developments. On the other hand as there is dependence concerning the progress of both. This interaction could also provoke negative interferences in the development.

The research in technology of electric vehicles for logistics purposes is still ongoing and not yet ready for serial production. So the technology is not yet established which bears the risk that other developments could interfere.

From the carriers and the transportation industries point of view it is understandable that there is a psychological barrier to invest into technology which is not yet sufficiently tested in everyday use. The elevated cost of purchase compared to conventional vehicles is another reason that hinders its dissemination 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:

The preparation phase covers the development of the technology of the three different kinds of vehicles as well as the open innovation and dissemination actions. These accompany the project during the 3 years of its duration whereas the research on the technologies is planned to be finished after a 2 year period.</td><td>2. Implementation:

The implementation itself is dominated by the establishment of the novel logistics concepts. As the intermediary results of the techno-logical research influence the concepts, the possibility for adaptions within the implementation process is necessary.</td><td>3. Operation:

The application of the new technologies and processes in urban logistics business scenarios covers the final stage towards operation. The demonstrator phase shows proof of concept and proof of technology and shall provide the basis for operational business cases.</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?

There are 4 main types of actors in the project:

1. Integrators: Their task is to co-ordinate the project internally, to make sure that communication between the partners is efficient and to build up a platform for the interaction between the participants. Moreover they are also the project’s face towards external stakeholders. Their task is to provide results for the public and to promote and disseminate the project results wherever suitable.
2. Technical researchers: They conduct preparatory research on the three technical solutions, cooperate with the logistics researchers and do the necessary system adaptions for the implementation phase.
3. Logistic researchers: They draw up logistics concepts considering the results of the technical researchers as well as the latest findings of business development and concepts for integrating</td></tr>
</table>

	electric vehicles in supply chains. 4. Practical partners / testers / auditors: They test and evaluate the results of the researchers, define further requirements, suggest improvements, and audit the final results. Together, the partners unite different generic and specific innovative approaches and industrial applications. Given the diverse backgrounds of the partners, the network is highly complementary.
6.5) Process	The process was started by looking for suitable participants with different, complementary approaches to the topic. After establishing this platform, a basis for open innovation and dissemination had to be built up. The next step covers the technical research topics. The trials (simulation, modelling and identification) as well as the establishment of the novel concepts partly accompany and finally complete the following process step. Hereafter, the methods for dynamic operational planning are developed in the form of desktop and mobile applications. In the final step, the demonstrators are implemented and an overall evaluation of the results takes place, thereby completing the project. The results shall be highly visible for the public and ensure further dissemination activities. The demonstration phase is also accompanied by strong interaction with various external stakeholders. This integration of potential users and interested parties should help to continue the project as a real-life application and to avoid the gap between testing and commercial use. Experience shows that two factors especially form the basis for the success of the project: The thorough selection of the partners and the strong interaction within the project and its stakeholders.
6.6) Technical feasibility	Regarding long-term implementation, the technical feasibility of e-mobility for logistics purposes can be a reason for failure. For the project and the demonstration phase technical feasibility has been evaluated in advance, especially regarding the prototype vehicles in use. These prototypes all passed their basic proof of technology and only need to be adapted to meet the requirements of the pilot settings. The innovation and also challenge in this project is much more the non-technical proof of concept including the business case scenarios.
Cluster specific information	
7.1) Before-after comparison of distribution systems	As the project is an ongoing and evolving best practice, a before-after comparison is not possible at the moment. The demonstrator focuses on different scenarios: ▪ Parcel services in high-density urban areas (inner districts, shopping zones, pedestrian areas) ▪ Centralised supply of urban or suburban shopping malls ▪ Optimized consolidation and distribution solutions for dedicated branches (e.g. pharmaceutical, deep frozen,…) ▪ Home delivery services from chain stores in urban areas

7.2) Before-after comparison of impacts

All developed concepts in various business scenarios will reduce emissions by using electric vehicles.

It cannot be stated with certainty whether the overall number of kilometers driven in distribution will increase or decrease in the future, given that the e-commerce and B2C markets are growing, and shipments are becoming smaller each but more numerous.

Given the demonstration partners' combined fleet of approximately 1.500 vehicles, the potential was calculated if the fleet was replaced by battery electric vehicles (BEV) and hybrid electric vehicles (HEV). The overall reduction potential amounts to between a quarter and a third of the baseline CO2-emissions.

Table 1: Fleet emission calculation of benefits in EMILIA

Current fleet			BEV & HEV fleet						
Fleet	Annual fuel consumption	Annual CO2 emissions	Annual fuel consumption	Annual electrical energy cons.	Annual CO2 emissions from Diesel	Annual CO2 emissions from electr.	Combined annual CO2 emissions	Absolute annual CO2 reduction	Percentaged annual CO2 reduction
[1]	[10^6 Liter D]	[to]	[10^6 Liter D]	[GWh p.a.]	[to]	[to]	[to]	[to]	%
1500	**16.8**	**44410**	**11.6**	**7.3**	**30635**	**1204**	**31839**	**12571**	**28%**
270	5.8	15241	4.5	0.4	11998	68	12066	3175	21%
330	5.8	15298	4.8	0.0	12697	0	12697	2601	17%
900	5.3	13871	2.3	6.9	5940	1136	7076	6794	49%

Assumptions and numbers:
① Vehicles up to 3.5to („Sprinter") → BEV
② Vehicles over 3.5to (trucks) → HEV
③ HEV in urban and rural logistics: - 30% energy consumption
④ HEV on highways: - 10% energy consumption
⑤ energy consumption of BEVs up to 3.5to: 35kWh/100 km
⑥ 1 Liter Diesel = 2.64 kg CO2
⑦ 1kWh electric energy: 165 g C02 (conservative averaged value in AT)

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7.3) Before-after trial description

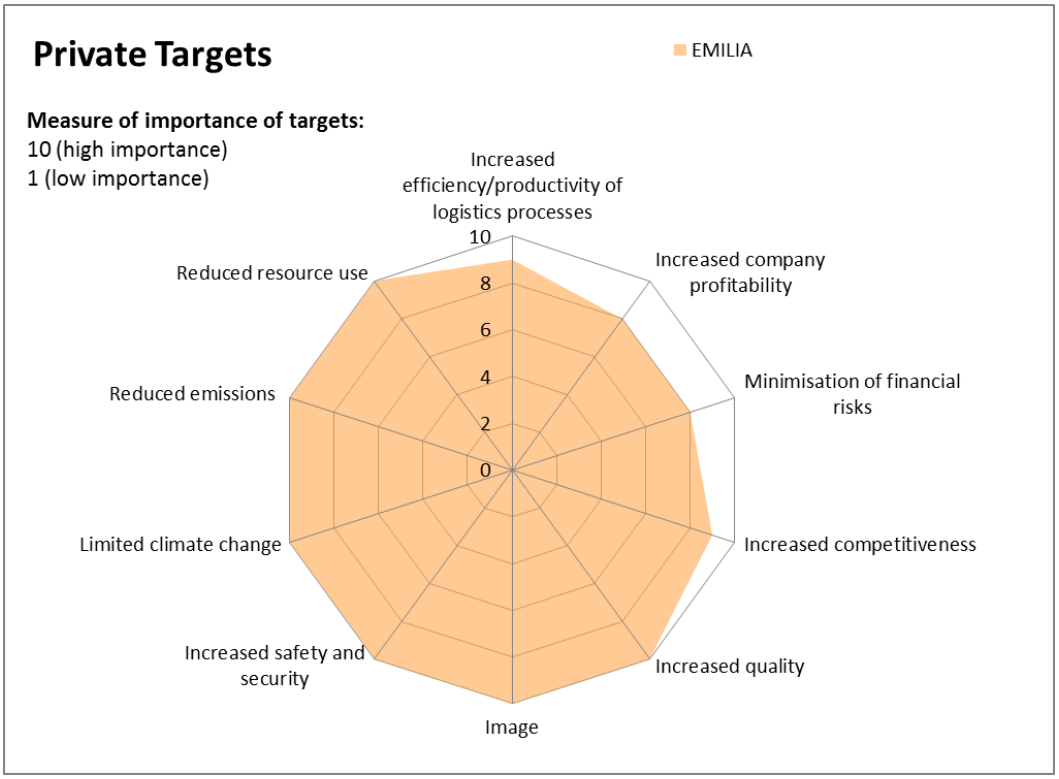
In order to cover a wide range of electric vehicles used for goods transport, three different kinds of vehicles are tested:

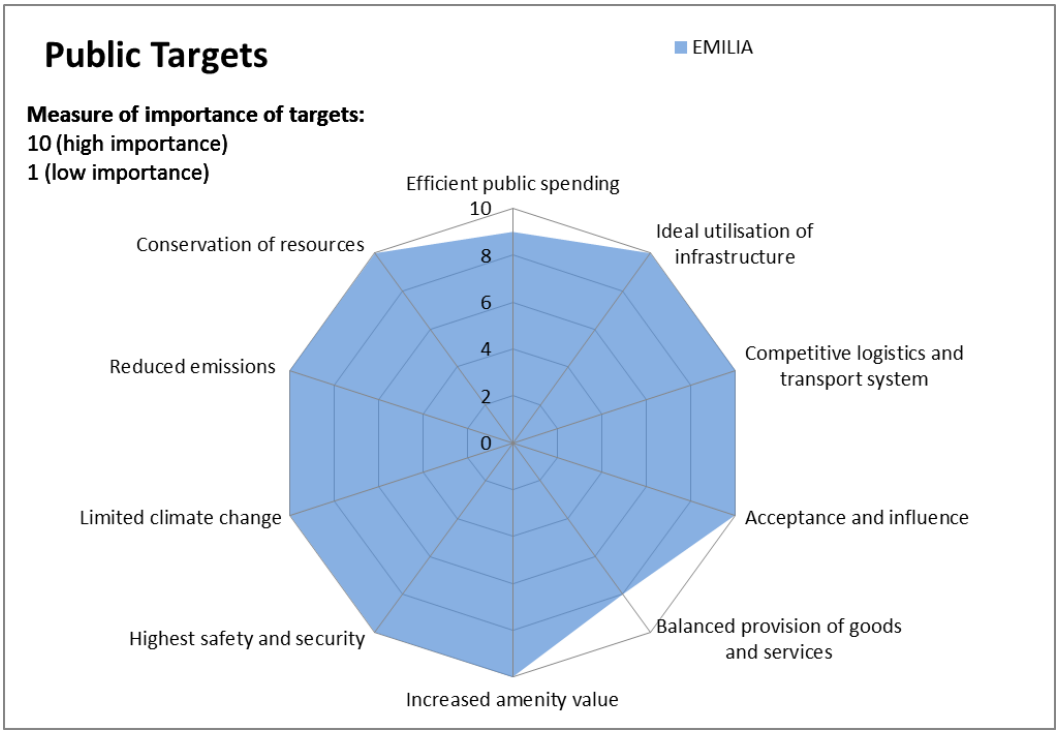
- an electric cargo tricycle,
- an electric light utility vehicle and
- an EMF Citylog which is a train that combines flexible single vehicles.

In order to simulate different situations the solutions will be tested in cities with different sizes, traffic situations and needs. At the moment it is planned to test the applications in Vienna, Linz and Graz. The tests will be fulfilled by the partners from industry applying the concepts modelled for the available technologies.

Demonstration implementations will be done in defined urban areas and different business scenarios. The trial phase will run until 2017, accompanied by a monitoring and evaluation process.

Evaluation of strategic targets





4.3 LOGeco − eco-friendly logistics

1. Basic information	
1.1) Identification	LOGeco − eco-friendly logistics
1.2) Cluster	Cluster 1 – Urban Freight
1.3) Responsible authors	Andrea Campagna (Sapienza Università di Roma) Katja Hanžič (University of Maribor)

2. Scope of practice	
2.1) Approach	☐ Private approach ☐ Public approach ☒ Public & private appr.
2.2) Actor classification	• Association of Manufacturers and enterprises of Rome, Frosinone, Latina, Rieti, Viterbo (Unindustria Lazio) • Chamber of Commerce Rome • Centre for Transport and Logistics (CTL) at the University of Rome "Sapienza" Cooperation Partners: • electric utility company (ENEL) • vehicle manufacturer (RENAULT) • transport and parking infrastructure manager (SABA PARCHEGGI) • express courier (SDA) • logistics companies (FM Logistic, SG Demand & Supply Chain Management, Mag-Di s.r.l - Soluzioni Logistiche) • general construction company (L.I.E.S. impresa generale di costruzioni) • car rental company (Amico Blu)
2.3) Geographical area	City of Rome – Tridente Mediceo (Historical Centre), Italy The best practice in being implemented on smaller geographical area of historical centre of Rome – Tridente Mediceo: • Total surface area: 440.000 square meters • Residents: 3.471 • Residential building: 2,384 • Parking spaces on the road: over 300 • Companies: 1.765 • Employees: 8,466
2.4) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.5) Implementation status	☒ Evolving Best Practice ☐ Best Practice The best practice is ongoing.

2.6) Date of implementation	2011: Survey on traders and traffic counts 2012: First Testing Phase - with transit point and two electric vehicles. 2013: Second Testing Phase - with different supplies chain and different vehicles and business sector. • Expansion of test on HoReCa distribution (temperature controlled) schemes; • Activation of 2 Transit Points • Gianicolo Parking for the 17.5t vehicles • Villa Borghese park for Renault Kangoo 4 mc • UDC stationed at the plant storage of Via Prenestina made available by Magdi • During 2013 this phase has been designed and the municipality requested due time for financial setup of the initiative. 2014: In July 2014 the second testing phase has been launched. The project is ongoing and is expected to end in June 2015.
2.7) Link to other clusters	The described best practice can be linked to Cluster 2 (Green Logistics and Co-Modality) as it uses electric vehicles therefore reducing CO2 emissions. It also has some links to Cluster 3 (eFreight) as it uses software solutions (online platform)
2.8) 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
2.9) 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 …
2.10) Supply chain elements	Transfer points, transhipment platforms: loading – transport – unloading
2.11) 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: …
	Please specify all other and different targets here…
2.12) 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:
Best practice	
3.1) Description of the practice	The LOGeco project deals with design and validation of a new model for urban logistics solutions that entails innovative and sustainable actions. The innovative aspect relies on the adoption of an unconventional public-private decision making process towards city logistics solutions, based on a win-win logic. As a first business case, a transit-point has been experimented in the very centre of Rome (Tridente area) with the involvement of the Municipality and private operators, using electric vehicles and oriented to study a business model to make such a solution economically and environmentally sustainable. This business case supports the change in regulation and access rules to the area, and to increase in logistics operation efficiency. LOGeco involves all the relevant public and private stakeholders op-

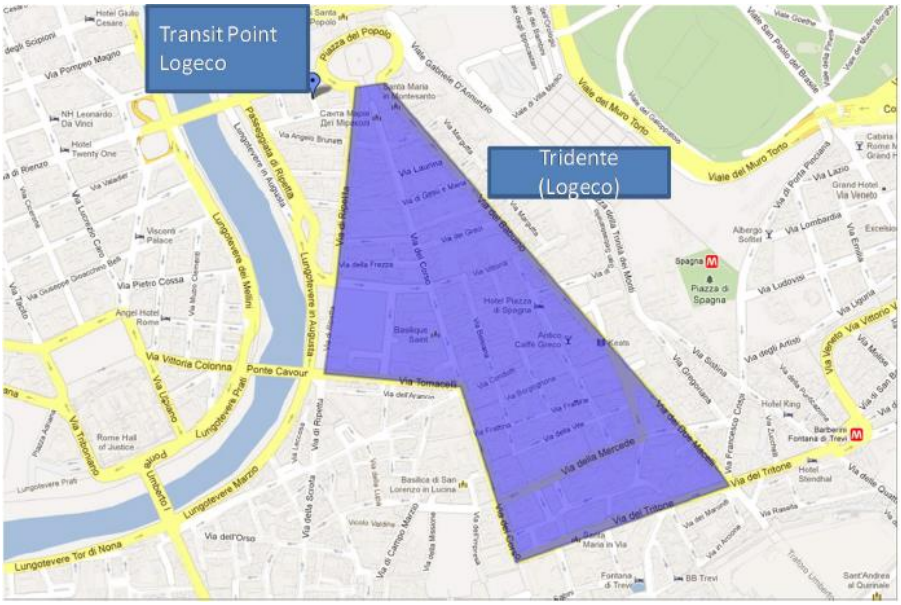
	erating in the different distribution chains affecting the urban freight sector, and defines sustainable solutions for the 'last mile', including electromobility, for the benefit of the liveability of the urban environment and, at the same time, of the tourist and commercial activities. LOGeco has been created within the activities of the Group of Transport, Infrastructure and logistics of UNINDUSTRIA. Inspired by the pedestrianization project of the "Tridente" area in Rome, LOGeco defines and puts into practice a new procedural model for city logistics solutions, together with practical operational solutions in the short/medium term and the information useful for the effective and efficient implementation over the long term. The aim is to reduce the impact of freight entering the historical area without penalizing economic activities, but rather creating business opportunities for companies in the area. The small geographic area of Tridente hosts 1.112 businesses - 785 independent businesses and 327 brand shops and stores belonging to retail chains. 44% of businesses reported (490) belong to the sector of retail trade of clothing, footwear, leather bags and accessories while 18.3% (203) are the HoReCa sector (Hotels, Restaurants, Bars). Jewellers and goldsmiths together account for 8% of the surveyed activities. Every day over 19,000 vehicles enter the Trident out of which more than 1,000 are freight vehicles. The model allows to: • implement the policies of the Administration; • understand the needs of the involved industries; • meet criteria for the improvement of the current distribution practices according to environmental, social and business sustainability. The model consists of a tool specifically designed for management (and promotion of management) of economic activities within the supply chains affecting urban distribution flows. Direct institutional actions supported by the Administration with the involvement of stakeholders (mobility agency, industrial associations, retailers, shop owners, transport operators, etc.) is major part of it. LOGeco is a viable and sustainable solution. Designed for its economic sustainability in the long run, it is not dependent on municipal funding. As a result, the good practice aims to make the distribution process in urban areas more efficient in terms of costs, time saving and environmental impact. LOGeco has shown: - the ability to have important results regarding the energy efficiency for the last mile; - the viability and sustainability of the identified solutions. The first phase of LOGeco tested a Transit Point with electric vehicle distribution, while in the second phase of LOGeco urban logistics nodes for the last mile goods distribution of several supply chains with additional vehicle technology (e.g. LNG, hybrid) were being tested.

3.2) Technical main characteristics	• Hardware: an on-board computer in the Renault Kangoo ZE; • Software: Fleet management system for the vehicle tracking, owned by the Centre for Transport and Logistics (CTL) at the University of Rome "Sapienza"; • Application model with structured questionnaires for the involved supply chains.
3.3) Success factors	LOGeco relies on a win-win approach to policy making providing benefit at the same time both for the Public sector (reduction of externalities, support to the quality of life of citizens, promotion of activities, etc.) and for the private (new business opportunities in logistics and distribution services, promotion of electric vehicles in the market, new urban logistics infrastructures, etc.). LOGeco involves the establishment of a management committee in which the stakeholders (mobility agency, industry associations, traders, logistics operators) are allowed to contribute to the decision making process. The project, for its complexity and multisectoriality, has required many qualified contributions: at first the Municipality of Rome, "Sapienza" University, Mobility Agency of Rome, but also important enterprises associated with UNINDUSTRIA have provided their expertise and specific experience. Among these are: ENEL; Renault, which has provided the means for testing electric Kangoo; logistics operators like as Sg Logistic Solutions, FM Logistics; SDA express courier; Saba Italia, LIes.
3.4) Main benefits	LOGeco contributes substantially to the reduction of consumption for last mile transportation. With regard to the test, 218 kg of CO2 saved were calculated for each vehicles in the experimentation period. A drastic reduction of the CO2 emissions in Rome City Centre, bringing up – at the same time – a new distribution model able to positively affect not only the environment but also business aspects and quality of life. Demonstrated: • The traffic that affects the area of Rome City Centre is composed of only 4% of freight vehicles, whose contribution to the environmental impact (emissions, noise and vibration, congestion), however, is very significant because of the type of means typically used (diesel) and the distribution practices (stop in second rows, make frequent stops over short distances, slowing down to look for a break, stop in prohibited areas, multiple passes, discharge times, etc.). • Over 70% of the business in the area does not fall in the category of big brands, or large-scale distribution. In respect of this, city logistics solutions like LOGeco would have a beneficial effect on reducing the impact of freight traffic; • The implemented solution should also be considered for the movement of personnel (sales representatives, technicians, maintenance, etc.) in the testing area; • The cost per kilometre of an electric vehicle is up to 5 times less than an equivalent gas oil vehicle; • The distribution practices are conditioned by the type of service that, in urban areas, also involves several stops on a few

	metres, making the use of conventional vehicles untenable from an environmental point of view.
3.5) Cost indication	Test phase: €. 180.000,00
3.6) Barriers / Limitations	LOGeco has demonstrated to be an effective model, which would create conditions to promote economic activities within the supply chain that affect urban distribution flows. Barriers encountered are mainly concentrated in particular barrier of lobbies, of traders and citizens who, for example, do not want any change. The absence of a political agenda on the topic may specify a risk to the implementation of innovative policies and introduction of efficient technologies. More than 40 meetings with stakeholders have solved most of the difficulties presented. Distribution in urban areas can represent a difficult issue but implementing local and customized green solutions (as LOGeco does) can have positive effects not only on CO2 emission but also on business and welfare policies.
3.7) Common practice before implementation	No use of electric vehicles for last-mile distribution and no initiative of public-private collaboration to setup a transit-point have been in place. Specific knowledge on last-mile phenomena, such as type and dimension of the different supply chains characterizing the freight demand in the area, was not available to the Municipality. No public approach to planning logistics solutions was active.
3.8) Motivation/problem	LOGeco has been created within the activities of the Group of Transport, Infrastructure and logistics of UNINDUSTRIA. Inspired by the pedestrianization project of the "Tridente" area in Rome, it aims at identifying practical operational solutions in the short / medium term to reduce the impact of freight entering the historical area without penalizing economic activities, but rather creating business opportunities for companies in the sector.
3.9) Justification of practice	**Innovation and feasibility**: LOGeco is a viable and sustainable solution improving current distribution practices with a view to environment, society and business. Designed for its economic sustainability in the long run, it is not dependent on municipal funding. **Strategic focus**: Definition and implementation of a new procedural model for city logistics solutions, together with practical operational solutions in the short / medium term and the information useful for the effective and efficient implementation over the long term. **Impact**: Reduction of the CO2 emissions in Rome City Centre and at the same time implementation of a new distribution model positively affecting not only the environment but also business aspects and quality of life. **Transferability**: The LOGeco model is highly transferable because it is generalised. It is a method to arrive to suitable solutions for the last mile for every urban context.
Transferability and scalability	
4.1) Geographical	Can the solution be transferred to other countries, regions or cities?

Area	☒ 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) Scaleability, growth potential	Can the solution be scaled-up, growth and obtain a bigger market share? ☒ Yes ☐ No
	The solution can be scaled up, as there are no constraints for obtaining bigger market share. LOGeco solution is very flexible and generalised - it is a method to arrive to suitable solutions for the last mile for every urban context.
4.3) Usability in other domains	Can the solution be transferred to other actors or industries? ☒ Yes ☐ No
	Modified model could be used in any area with great density of industry, retail or production in geographically limited area.
4.4) 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
	Best practise case encompasses also the administrative requirements for adaptation of legislation and framework conditions in favour of the project.
4.5) 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
	Every urban area would benefit from the given model, which is quite generalized and therefore adaptable to different areas.
4.6) Similar cases	As for the technology used (electric vehicles) and the type of logistics solution adopted in the first stage of the project (transit point), several cases can be found in Europe (e.g. Paris, Utrecht). As for the approach to generate solutions with the involvement of public authorities and private operators in a win-win logic, and using an overall method from data collection to business modelling through business opportunity evaluation, we can state this is the first case.

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

analysis	The project LOGeco directly addresses some of the key strategic targets limited climate change, reduced emissions, ideal utilisation of infrastructure, competitive logistics and transport system, acceptance and influence, limited climate change, reduced emissions and increased efficiency/productivity of logistics processes. The case is highly transferable and has full access to information.
5.2) References	http://www.logeco.it/
5.3) Contact for further details	Andrea Campagna andrea.campagna@uniroma1.it CTL - Centro di ricerca per il Trasporto e la Logistica Sapienza Università di Roma Via Eudossiana 18 - 00184 Roma Phone +39.0644585136 UNINDUSTRIA Dr. Marco Galluzzo Via Andrea Noale, 206 - 00155 Roma, Italia Phone +39 06 844991 F +39 06 8542577 info@un-industria.it
5.4) Date of review	12/08/2014
5.5) Pictures	Please link, attach or insert pictures, pictograms etc. that show the main idea of the case (for broad publication) **Figure 26: Geographic area of LogEco implementation in Rome**  **Figure 27: LOCeco application tools on offer**

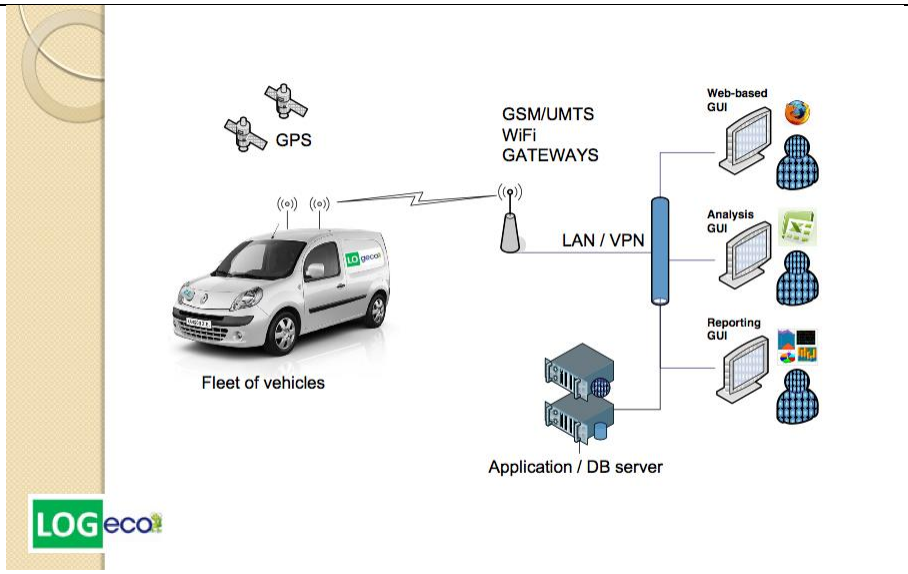
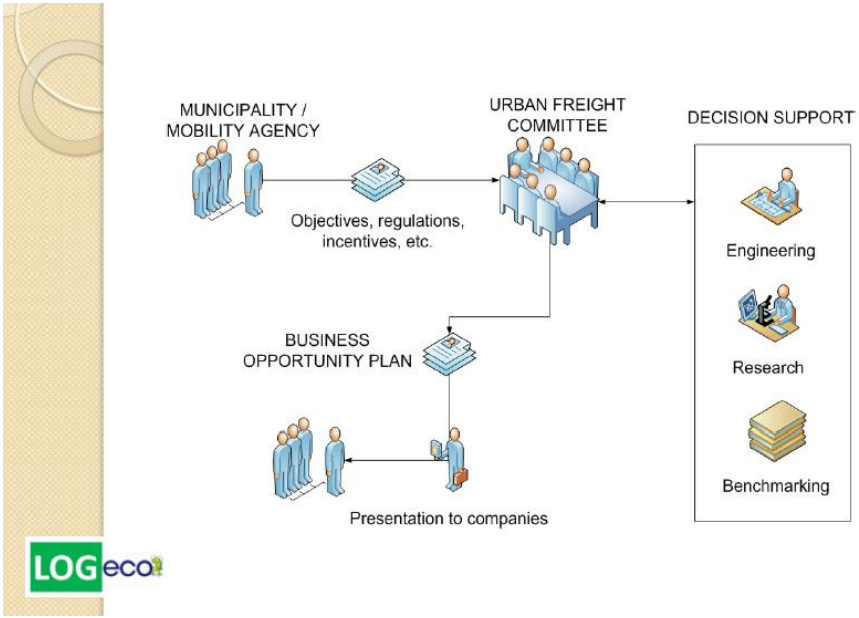


Figure 28: Conceptual operative model of LOGeco

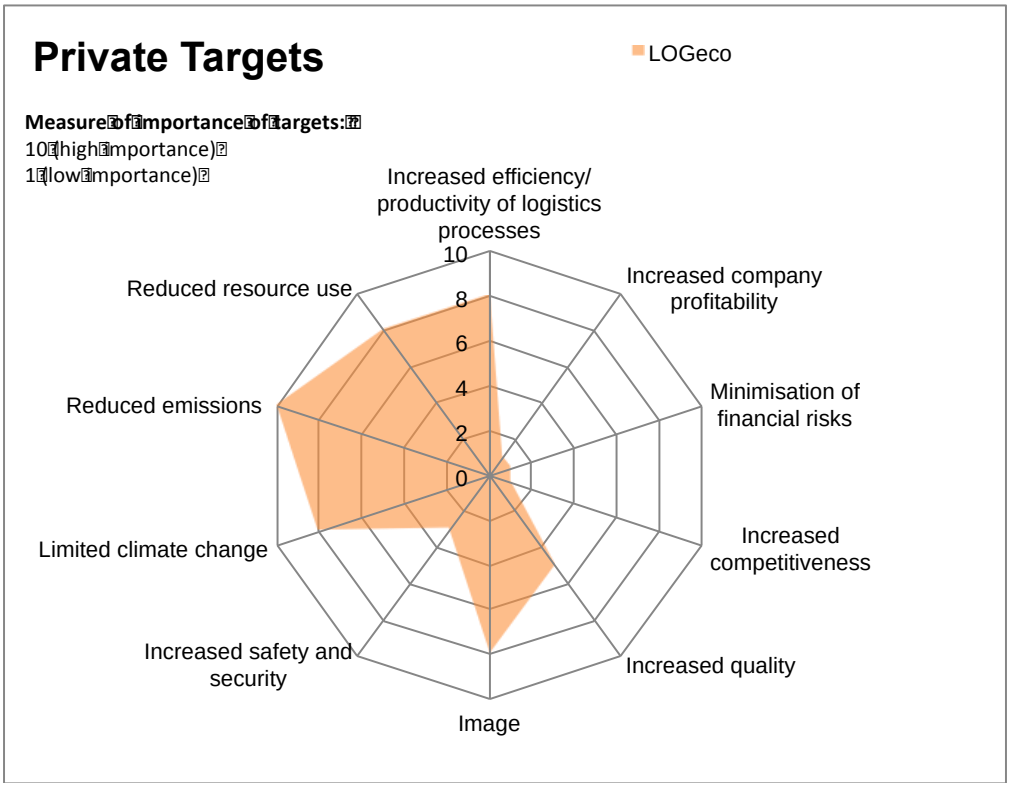


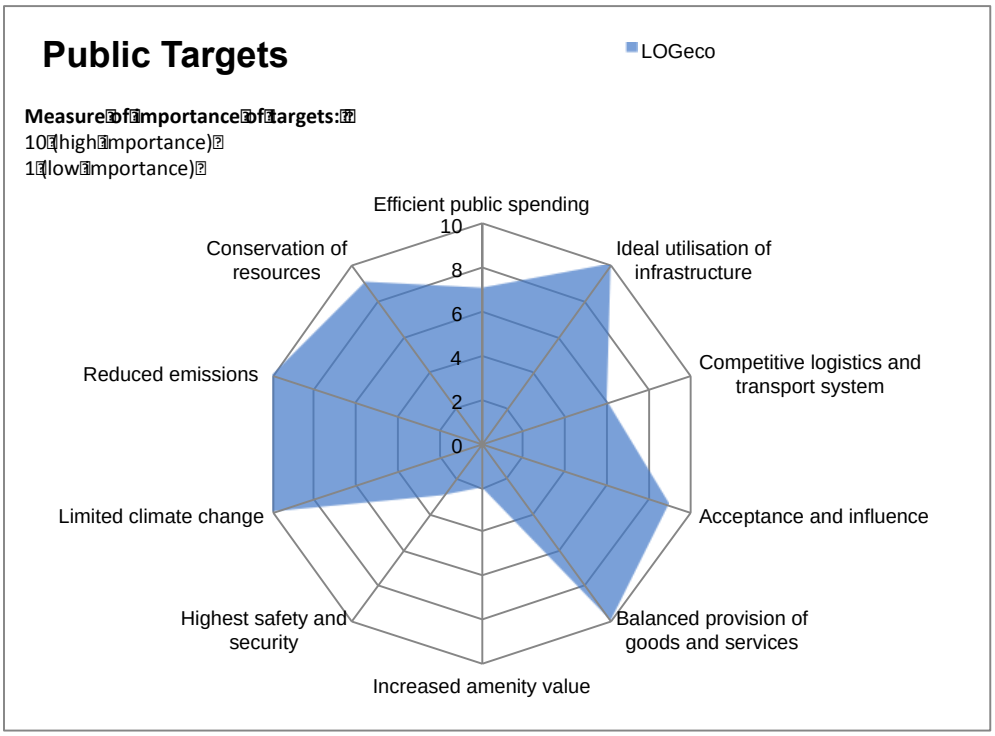
5.6) Involvement of SME	SMEs are involved in the logistics chain model of the case as well as the end beneficiaries. SMEs are involved in the planning and decision-making process as well as users/beneficiaries.
5.7) Impact on SME	SMEs can benefit of the opportunity the city logistics solution can bring (reduced cost of logistics infrastructure, reduced cost of last-mile third party delivery, avoidance of the cost of the permit for the central area, etc.) but only in case they are available to re-align their supply chain, meaning a change in the distribution practices in order to optimize the channel according to the solution (e.g. UCC, transit point, access regulation).
5.8) Opportunities for SME	The SMEs are involved directly (as shippers, loaders, developers and as stakeholders in decision-making process) and well as indirectly as end beneficiaries.

<table>
<tr><th colspan="4">In-depth information</th></tr>
<tr><td>6.1) Costs</td><td colspan="3">• What are the (estimated) costs (e.g. investments, operation)
Test Phase: 180.000 EUR
• What financing is presently applied/planned (partnership, private, public funding)</td></tr>
<tr><td>6.2) Benefits / Strengths</td><td colspan="3">It is too early to quantify the benefits of LOGeco</td></tr>
<tr><td>6.3) Weaknesses</td><td colspan="3">• What are the main weaknesses of the project, concept, strategy, initiative?
LOGeco, as innovative approach to public-private decision making process, relies on active participation of all relevant public and private stakeholders operating in the different distribution chains affecting the urban freight sector. Their involvement and active participation has to be ensured.
• What are the main risks?
Main risks lay in fact that lobbies (of traders and/or citizens) who are sceptical about proposed changes can be very active in preventing the implementation of this new approach.
The absence of a political agenda on the topic may pose another a risk to the implementation of innovative policies and introduction of efficient technologies.
Distribution in urban areas can represent a difficult issue but implementing local and customized green solutions (as LOGeco does) can have positive effects not only on CO2 emission but also on business and welfare policies.
• Are there undesired secondary or external effects?
No</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: …
Preparation phase:
Involvement of all relevant stakeholders including policy makers, local business owners, clusters and associations, logistic operators, and local population</td><td>2. Implementation: …
Test phase</td><td>3. Operation: …
Implementation phase</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?</td></tr>
</table>

6.5) Process	More than 40 meetings with stakeholders have solved most of the difficulties presented.
6.6) Technical feasibility	*Is this practice feasible in technical terms?* Yes, there are no special technical requirements that would hinder implementation of the LOGeco approach.

Evaluation of strategic targets





4.4 Electric Removal Truck, Aad de Wit Verhuizingen

Basic information	
1.1) Identification	Electric Removal Truck, Aad de Wit Verhuizingen
1.2) Cluster	Cluster 1: Urban Freight
1.3) Responsible authors	Mobycon (Jaap Sytsma, Ronald Jorna)
Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Moving company
2.3) Geographical Area	The Netherlands, Amsterdam
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	The first full electric truck was introduced in 2011. Now, 53% of the company's fleet consists of electric vehicles.
2.5) Date of implementation	October 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, infra-structure ☐ 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 …
	Aad de Wit uses 2 electric trucks, 1 hybrid Volvo v60, 4 electric Renault Kangoo's, 1 Nissan E-NV200 electric van, 1 Elmoto electric scooter and 1 EEEEfun electric scooter.
2.9) Supply chain elements	Removals from one address to the other by electric truck in the area of Amsterdam. Aad de Wit has equipment for relocation, as well as for the storage of household goods and archives.
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: …
	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)…

Best practice	
3.1) Description of the practice	Please provide a description of the solution, give details about the **purpose** and the **sustainability objectives**. Aad de Wit uses now two full electric trucks for removals. Hereby, the company fulfils current and coming environmental rules and regulations implemented in Amsterdam. The company offers now a zero-emission furniture removal service in the city, but in fact they can offer it country-wide. The electricity used by the trucks is 100% green energy (solar and wind energy). Besides, the trucks are more silent compared to conventional removal trucks. Removals by Aad de Wit can be done in a clean and quiet manner.
3.2) Technical main characteristics	What are the technical main characteristics? The first electric truck Aad de Wit purchased in 2011 had a range of 150 kilometres, based on a 120 kWh battery. The second truck they bought (2014) has a range of 250 kilometres and uses a 200 kWh battery.
3.3) Success factors	What are the main success factors of the practice? Why does it work so well? Relative short distances in the greater Amsterdam area that perfectly meets the capabilities of electric trucks.
3.4) Main benefits	What are the main benefits of the practice? (Compare strategic targets selected in the survey → D2.1) • *Financial benefits?* - Lower operational costs • *Economic benefits?* - Better image - Expensive unique selling point for large sustainable (governmental) tenders and companies that want to show their sustainability. • *Benefits in the field of services?* • *Benefits for the society?* - Silent trucks • *Environmental benefits, expressed in CO2 or CO2equivalent?* - Limited CO2 emissions and climate change • *Other signs/indicators of success?* - Aad de Wit Verhuizingen won the Transport en Logistiek Nederland (TLN) 2012 award for extreme sustainable business operation. - Electric removal services are offered with the registered trademark “Verhuis Elektrisch” (Remove Electric). Please provide when possible relatable measures, units and the relevant calculation base.

3.5) Cost indication	2011 Electric AGV truck (12t GVW, 37 cbm capacity, 120 kWh, 150 km range): 180,000 euros. Normal diesel truck: 45,000 euros. 2014 Electric Hytruck (12t GVW, 49 cbm capacity, 200 kWh, 250 km range): 284,000 euros. Normal diesel truck: 45,000 euros.
3.6) Barriers / Limitations	What were the main barriers and limitations to overcome for the implementation? And how was it managed? An electric truck is about 4 times as expensive as a normal truck. Therefore the company got financial support from Stichting DOEN and energy supplier Greenchoice to buy the first truck. The second truck was part of the Proeftuinproject Elektrisch Rijden from the Rijksdienst voor Ondernemend Nederland (www.rvo.nl). The government paid a part of the additional costs for the electric truck. The operational costs are slightly lower though not enough to pay back the higher investment costs.
3.7) Common practice before implementation	The company as well as it competitors used conventional fuelled removal trucks.
3.8) Motivation/problem	What was the main problem or motivation that led to the development and introduction of the new practice? Aad de Wit wants to stand out as a frontrunner in the area of sustainability in its industry. First they offered CO2 compensation but as this became a standard, they looked for new opportunities to show their Corporate Social Responsibility. In 2008 Aad de Wit Removals introduced CO2 neutral removals, now this is the standard for the industry association of Erkende Verhuizers (OEV). Also the electric trucks help to overcome rules and regulations mentioned to limit negative environmental effects in the city of Amsterdam.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? It is the first (Dutch) removal company that uses full electric trucks whereas it seems rather logic to use electric trucks for removals, as distances are often short enough to use these trucks. Besides, it can be transferred easily to other cities and countries.
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, though financial support is important to overcome the high purchase costs.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ■ Yes ☐ No

	All sectors where distances are limited can use electric trucks.
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
	Financial support is important because of the high investment costs. On the other hand, strict environmental regulations can support companies to consider the purchase of an electric truck.
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
	All areas and cities where removals are done on not too long distances can facilitate electric removal trucks. And because of the still increasing capacity of the batteries, range limitations are decreasing in importance.
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. There are no similar companies known who offer electric transport at the same scale at their business operation. However, there is a new company in Amsterdam 'Taxi Electric' that from the start only uses electric taxi. Aad de Wit tries to promote electric mobility actively. It is the only end-user that is member of the industry association for electric mobility (DOET). As part of the initiative of 'MKB test elektrisch' (SME tests electric), Aad de Wit offered several Amsterdam SME to use an electric car. Aad de Wit also stimulates other removal companies to use electric trucks. Now two companies (one in Amsterdam, one in The Hague) decided to buy an electric truck.
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 First Dutch removal company with electric trucks. Aad de Wit Verhuizingen is expecting to replace its full fleet with electric trucks in the coming years.
5.2) References	http://www.aaddewit.nl/mondial-aad-de-wit-verhuizingen-kiest-als-eerste-voor-elektrische-verhuisauto/ http://www.aaddewit.nl/mondial-aad-de-wit-blij-met-laadpaal/ http://greeneconet.eu/node/124

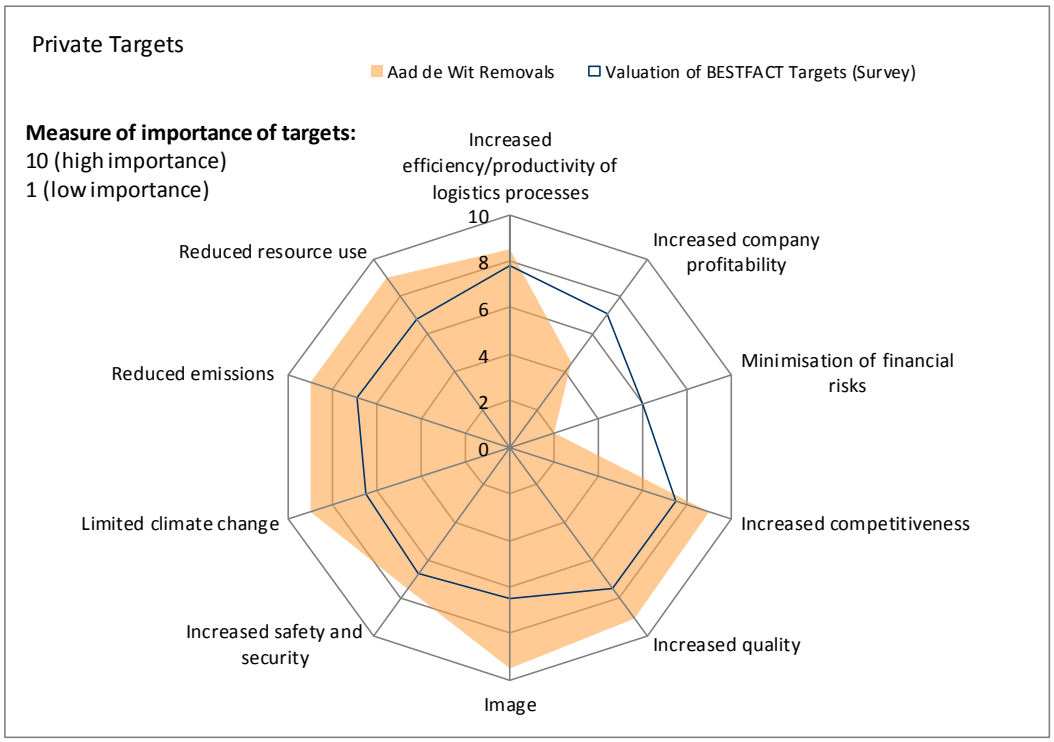
	http://greeneconet.eu/zero-emission-furniture-removal-service www.youtube.com/watch?v=zFNAdDDK3mY http://www.noordhollandsdagblad.nl/stadstreek/kennemerland/article11812751.ece/Elektrische-verhuisauto-onthuld-in-Castricum-(video)?tabPane=Comments
5.3) Contact for further details	Aad de Wit Verhuizingen B.V. Postbus 313, 1900 AH, Castricum, The Netherlands, call: +31(0)251 652439. Contact person: Jan Laan, email: janlaan@aaddewit.nl
5.4) Date of review	Latest date of update of this format (06/10/2014)
5.5) Pictures	 **Figure 29: Aad de Wit clean fleet**  **Figure 30: Aad de Wit clean truck with 12 t GVW and 49m^3 capacity**
5.6) Involvement of SME	Aad de Wit Verhuizingen B.V. is an SME with approximately 20 employees.
5.7) Impact on SME	There is no specific impact of using electric trucks for SME furniture movers. Maybe access to capital to finance the expensive electric trucks is more difficult for SMEs than for larger companies.

5.8) Opportunities for SMEs	Similar SME businesses could start developing this solution in other cities or countries.
In-depth information	
6.1) Costs	What are the (estimated) costs (e.g. investments, operation) The investment costs for an electric truck are much higher compared to conventional trucks (see also 3.5). This is largely due to the expensive battery packages, which make up about half of the price of an electric truck. The operational costs of an electric truck are slightly lower compared to conventional trucks. This is because for electric trucks no road taxes need to be paid and fuel is much cheaper. However, the latter plays only a marginal role because removal trucks do not drive most of the day and only drive about 10,000 km per year. The company owner thinks that if trucks drive 25,000 km or more per year, the lower fuel costs will play a much larger role. What financing is presently applied/planned (partnership, private, public funding) Because Aad de Wit Removals was the first transport company to buy an electric truck, they received support from a wide variety of sources. The government subsidized a significant part, an NGO took care of the cost for a spare truck (in case the electric truck had interferences), they got some funding from an industry association, they agreed on a partnership with an energy supplier to get a significant reduction in energy costs etc. For the first truck, the subsidy made up about 25% of the additional costs compared to a conventional truck, for the second truck this was about 60%.
6.2) Benefits / Strengths	It is very hard to quantify the benefits of the practice. However, Aad de Wit Removals experience that in general they can ask for business-to-business jobs a 4-10% higher price because they use electric trucks. Therefore, the clients accept a higher price. Furthermore, they got a lot, and I mean really a lot, of free publicity. In the past, the company owner was happy if they had a short article in the local newspaper, now being on national TV is not extraordinary anymore. This autumn, even a Belgian national broadcaster visited Aad de Wit Removals to make a video. In the transport sector they are seen as ambassadors and frontrunners in the field of electric mobility. Now even car producers ask them to test new vans etc. because the producer knows Aad de Wit has already a lot of experience and got a lot of publicity. Aad de Wit Removals uses the trucks (and also the electric vans they have) as ‘driving electric billboards’. This is how they got additional funding for the first electric truck and as ambassadors for electric mobility, they see it as their mission to promote electric mobility in the Netherlands. The CO2 emissions of the electric trucks are 0. The electric trucks use 100% green energy from solar and wind power. This is also the case for other electric vehicles used in the company and the energy used by the office. The conventional trucks use diesel but their CO2 emis-

	sions are compensated through the planting of trees. It is hard to say whether clients chose for Aad de Wit Removals because of their electric trucks or for other reasons. So their market size or share cannot be compared to the time before the trucks were purchased. With the electric trucks the company fulfils current and coming environmental rules and regulations implemented in Amsterdam. A removal truck can technically be used for about 20 years, largely because of the limited distances that are driven. However when someone now buys a new as clean as possible conventionally fuelled truck, it is likely that within 10 years, this truck is not allowed to drive in the city centre. With the electric truck, this is not the case because a cleaner truck is technically impossible. Therefore, the electric truck is an investments for a longer period of time compared to conventional trucks.
6.3) Weaknesses	The electric trucks had some malfunctions just because they were technically very new products and the first of their kind. Therefore, in the previous years a spare (conventional) truck was hold apart to use in case an electric truck could not operate. Now, the early weaknesses are solved and the spare truck was sold. Nevertheless, there are sometimes battery management interferences, and then an additional truck needs to be hired. However, the number of interferences is much smaller than was expected. The range of the trucks is limited to 150/250 km. This makes it sometimes, though rarely, necessary to use one of the three diesel trucks when distances are longer. The load capacity of an electric truck is slightly smaller than conventional trucks. This is because of the high weight of the battery packages. However, for removals this is not really an issue as holding capacity is much more important and this is not affected by the batteries. With the first electric truck, one kWh power costs about 1000 euros, now this is reduced to 650 euros. However, it is still much more expensive to purchase an electric truck than a conventional truck. Long term dedication to make the business sustainable is crucial to make it really work.
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: …
Look far ahead! A company needs a business model that is ready for long term investments and long term dedication to electric mobility.	Look for partners who are willing to participate in the project. They can subsidize or provide other forms of funding, e.g. discounts on energy etc. Also look for others in the sector, who want to buy an electric truck. Larger production numbers will reduce the costs of the truck. Use the electric truck as the perfect billboard for your company and your CSR policy. Make (potential) clients aware about the electric truck and how great it is that it exists. This is the way forward

		because we are running out of fossil fuels.
	Which actors are relevant in the process? Governmental organisations, NGOs, other transport companies, energy suppliers.	
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? The new company owners had the feeling that they had to stand out because removals are in its basics not an exciting industry. Because they realised the challenges climate change brings, they decided to focus on sustainability. First they only compensated their CO2 emissions. As soon as this became standard in the industry, they looked for other possibilities to distinguish themselves. First they cooperated with an English firm but they only offered small trucks. The best that could be offered at that time but not what they actually wanted. Then they decided to cooperate with the Dutch automotive industry and with them they developed the best they could get now. This was a full electric truck with similar qualities as a conventional truck (except the range). Several partnerships were made to make it financial possible. After this first truck, electric vans etc followed and together with Hytruck, a second truck with a much longer range was developed. Both are now in full operation and make up 40% of the total number of trucks.	
6.6) Technical feasibility	Is this practice feasible in technical terms? First it was not, but now it is, as this project shows.	
Cluster specific information		
7.1) Before-after comparison of distribution systems	There is no graph but it is said that planning is more important. The planners have to think smart about the range of the trucks, but for the rest, nothing has really changed.	
7.2) Before-after comparison of impacts	The company owners say this is not relevant or interesting. They do it for the future and because they can run their business. According to them, it is the only way forward and in the future all trucks will be electric. In fact, the CO2 emissions per removal are 0 if one of the electric trucks is used. The CO2 emissions of the diesel trucks are compensated.	
7.3) Before-after trial description	First a smaller truck was considered but it was decided that this was not what they were looking for. Therefore, a new collaboration was started, leading to the current trucks. And as was said before, first they only got very limited attention in the media. Now they are in a 'rollercoaster of publicity'.	
Evaluation of strategic targets		


Private Targets
Aad de Wit Removals
Valuation of BESTFACT Targets (Survey)
Measure of importance of targets:
10 (high importance)
1 (low importance)
Increased efficiency/productivity of logistics processes
Increased company profitability
Minimisation of financial risks
Increased competitiveness
Increased quality
Image
Increased safety and security
Limited climate change
Reduced emissions
Reduced resource use
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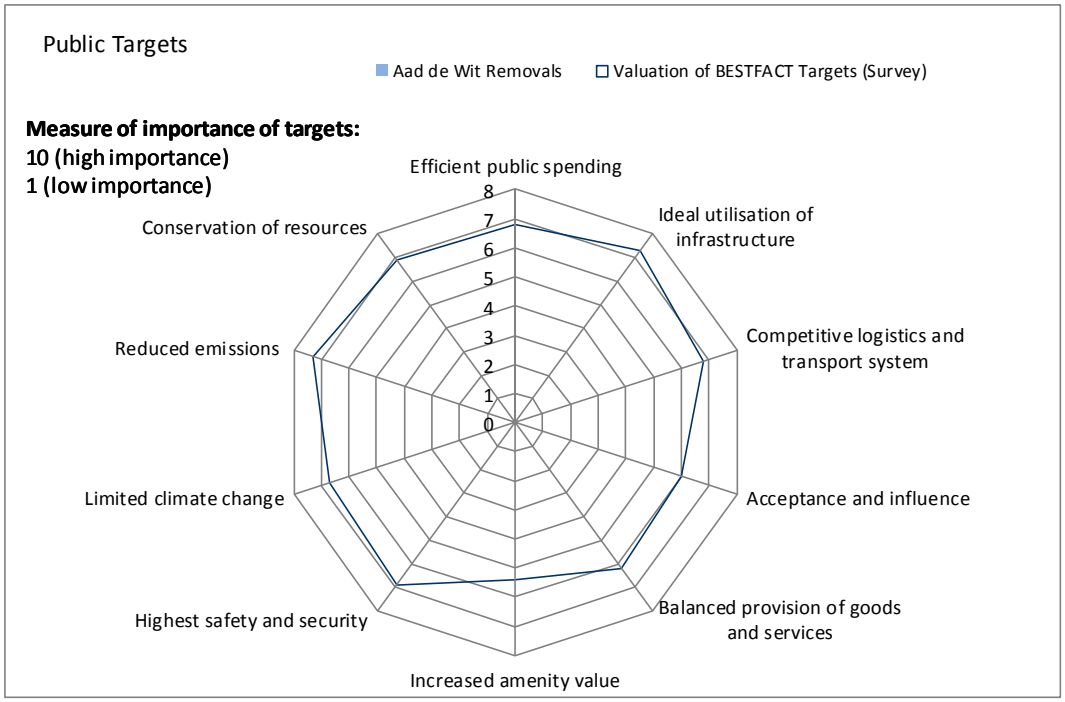
Public Targets
Aad de Wit Removals
Valuation of BESTFACT Targets (Survey)
Measure of importance of targets:
10 (high importance)
1 (low importance)
Efficient public spending
Ideal utilisation of infrastructure
Competitive logistics and transport system
Acceptance and influence
Balanced provision of goods and services
Increased amenity value
Highest safety and security
Limited climate change
Reduced emissions
Conservation of resources
8
7
6
5
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3
2
1
0

4.5 Mokum Mariteam

Basic information	
1.1) Identification	Mokum Mariteam (set up by Icova and Koninklijke Saan)
1.2) Cluster	1 (urban freight)
1.3) Responsible authors	Mobycon (Jaap Sytsma, Ronald Jorna)

Scope of practice	
2.1) Approach	■ Private approach ☐ Public approach ☐ Public & private appr.
2.2) Actor classification	Transport industry, shipping companies, municipality
2.3) Geographical Area	Netherlands, Amsterdam
2.4) Implementation status	Please indicate and explain the status of the case you describe. ■ Evolving Best Practice ☐ Best Practice
	Mokum Mariteam started in 2007 and is still running, in 2010 the ship was used for the first time.
2.5) Date of implementation	2007/2010
2.6) Link to other clusters	• Are there existing connections to another cluster topic? Yes, Cluster 2: green logistics and co-modality • 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, infra-structure ☐ 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 …
	The cargo is delivered by a 20 meter long full-electric ship on the canals of Amsterdam. This ship is also used for reversed logistics. For transport to and from the ship, a small electric truck is used.
2.9) Supply chain elements	What other elements of the supply chain are involved in the practice? (e.g. terminals, warehouses, transhipment platforms etc.) Scaffolds, pontoons, warehouses, transport, reversed logistics, urban logistics, services
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: …
	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)…

Best practice	
3.1) Description of the practice	Mokum Mariteam uses the canals of Amsterdam to transport goods and deliver services. Hereby it reduces the number of small- and medium-sized trucks in the inner-city. The ships are driven by silent and clean electric engines. Goods are transported through the city and delivered at its destination without noise pollution. Using existing transport units like rolling containers, pallets and mesh containers, the system can be implemented by new clients and partners without any problems. This makes it possible to scale up the system gradually. Returned goods like waste and residues are transported from the place of use in the same efficient and sustainable manner. This system of reversed logistics increases the efficiency of the distribution concept considerably.
3.2) Technical main characteristics	The vessel is 20 meters long, 4.25 meters wide. It has space for 85 m3 of cargo. A full-electric engine drives it. It has a hydraulic crane, with its own hydraulic power pack, driven by the batteries.
3.3) Success factors	• Better use of the available infrastructure in Amsterdam • Reduction of trucks in the city centre • Reversed logistics reduces the number of vans even further • Involved organisations see the advantages of sustainable transport by ship
3.4) Main benefits	• Financial benefits: - The main benefit is the contribution to the image of the companies - Bulk goods are a bit cheaper to transport, caused by lower number of vehicles that is needed. • Economic benefits: • Benefits in the field of services: • Benefits for the society: - Limited number of accidents on the road - Decrease in damage to the quay, caused by trucks • Environmental benefits, expressed in CO2 or CO2 equivalent: - Reduced emissions - Reduced noise pollution - Energy savings - Sustainable transport system - Less restrictions caused by time windows
3.5) Cost indication	The ship cost €900,000. Hiring the ship costs €125-150 per hour
3.6) Barriers / Limitations	The mind-set from the transport companies needs to be changed. Transport over water must become part of the general way of thought of the transport planners. Because it is unknown, it is unknown. Transport by ship gives additional costs but these can be reduced if transport is clustered.

3.7) Common practice before implementation	Trucks driven by engines running on conventional fuels mainly did transport in Amsterdam's city centre. They used busy roads, reducing the quality of life in the streets.
3.8) Motivation/problem	Overcrowded streets, partly caused by trucks as well as high levels of air pollution. On the streets in Amsterdam are also many incidents where accidents are just missed by luck.
3.9) Justification of practice	Why can this case be considered a Best Practice (compare definition in **Dow**)? The approach of Mokum Mariteam is innovative and addresses both business and policy objectives. It can also be transferred t other companies or other cities.

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)? The city should have canals/rivers and companies located close to them.
4.2) Usability in other domains	Can the solution be transferred to other actors or industries? ☐ Yes ■ No
	It focuses already on a wide variety of services that were previously done by trucks or cranes.
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
	It should be possible to transport goods on the canals and ships should be allowed to moor wherever it is needed. Furthermore restrictions for regular trucks/vans (e.g. time windows, size, loadfactor) make distribution of goods by ship more competitive. Also there needs to be space to unload the ship: parking facilities etc. prevent this sometimes.
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 ship has been built for short distances transport in the city. However, other cities with canals could use this solution as well.
4.5) Similar cases	Similar cases exist, such as the beer boat and eco-boat in Utrecht (but only for one purpose), and parcel distribution with ship and e-cargobikes in Paris.

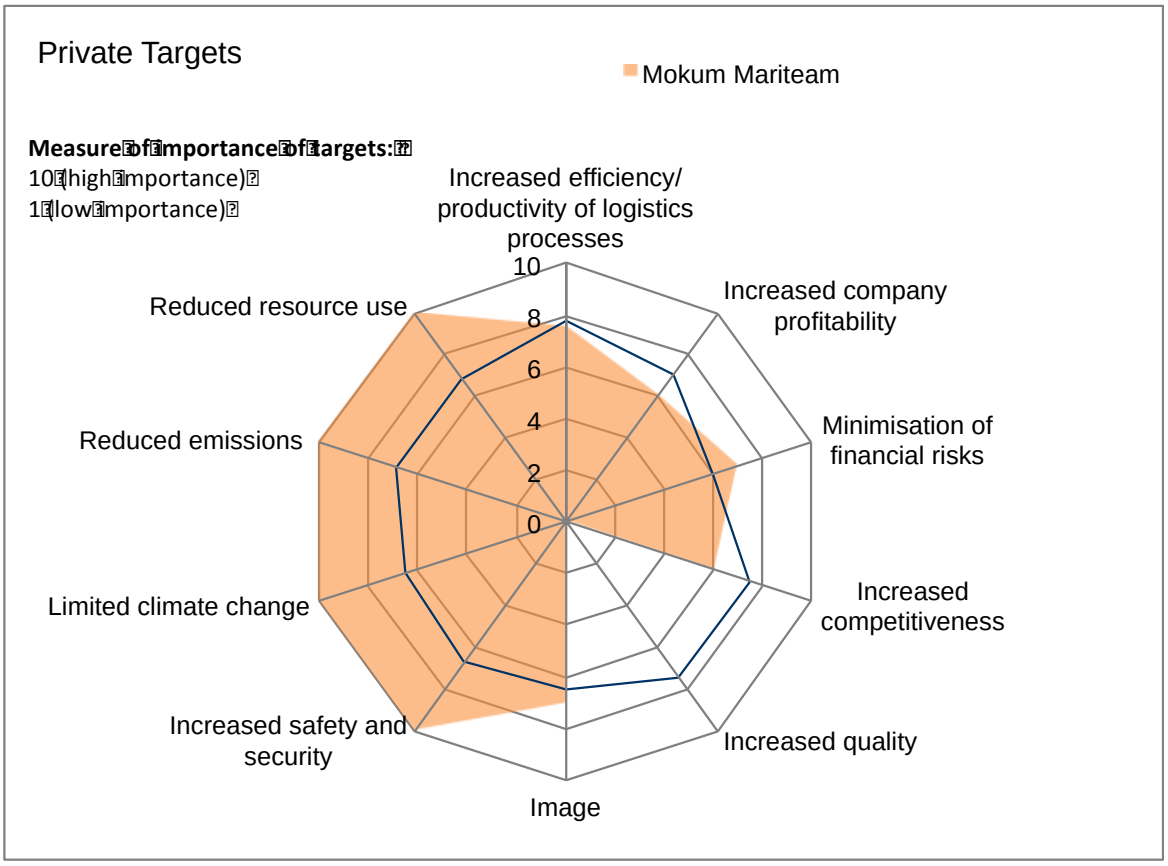
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ■ Yes ☐ No
	It is a very innovative case and it should be possible to transfer it to other cities.
5.2) References	www.mokummariteam.nl
5.3) Contact for further details	Willem Post, w.post@mokummariteam.nl, +31 6 21593011
5.4) Date of review	6 November 2014
5.5) Pictures	**Figure 31: Pallet delivery using the vessel of Mokum Mariteam** 

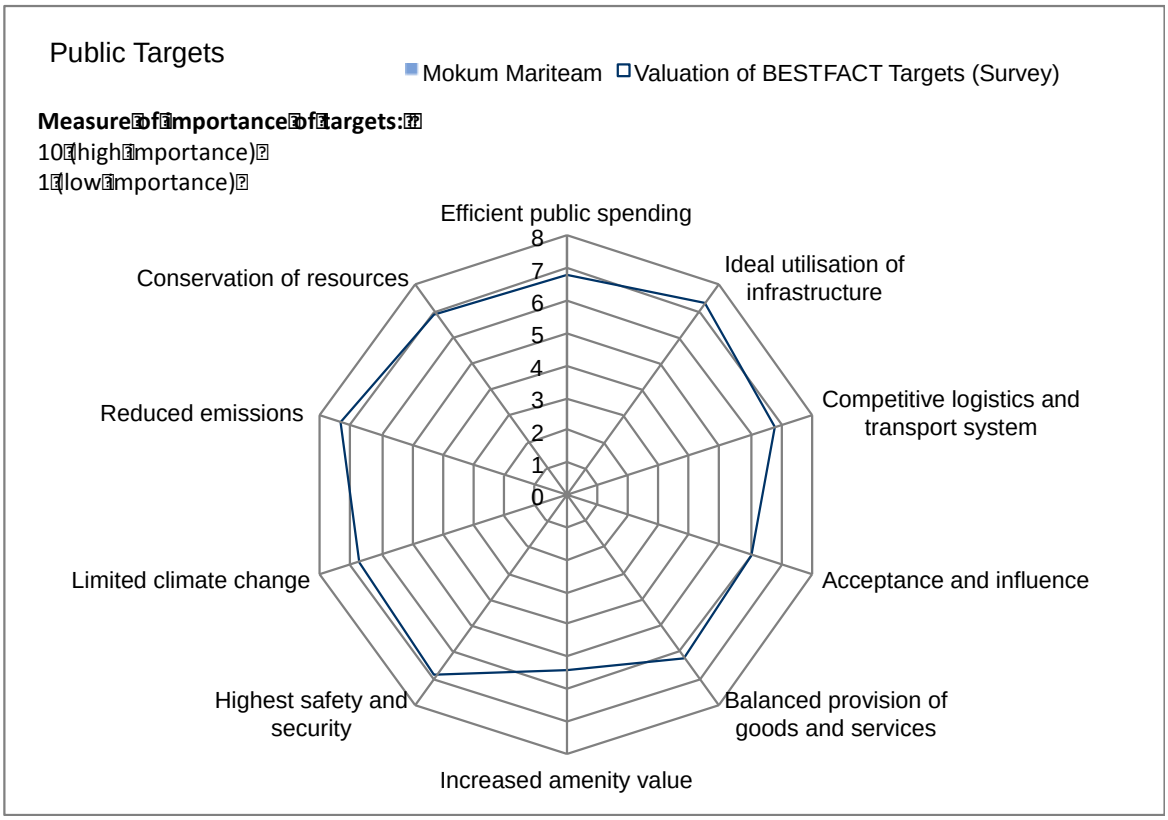
	Figure 32: Loading of a container for construction waste collection in Amsterdam 
5.6) Involvement of SME	Yes, SME's can hire Mokum Mariteam to get their deliveries to the places they need. Hotels are the main SME's that hire Mokum Mariteam.
5.7) Impact on SME	Mokum Mariteam helps to get an image of sustainability as well as it helps with reaching their CSR goals. If these SME's grow, it is likely they will hire Mokum Mariteam more often.
In-depth information	
6.1) Costs	The investment costs for the new ship were about €900,000. By far the largest majority of this amount was paid by the initiators of the project: Saan and Icova. The municipality subsidized the project with about €50-60,000. A new second ship would cost about €700,000. The €200,000 difference comes because it was the first ship in its kind so there were a lot of development costs. Also costs for engineering and programming the electric engines cost more than expected. It is a full private partnership between Saan and Icova. Energy costs about €7,000 a year, maintenance about the same. Depreciation is unclear because it is not known yet how long the ship can operate. The battery, crane and engine will need to be replaced in 7-10 years.
6.2) Benefits / Strengths	Please describe and where possible quantify the benefits of the practice *(For the description of benefits please refer to the addressed strategic targets, see 2.10)* *Changes are best monitored through changes in key performance indicators (KPI). Please indicate recorded deviations or assumed changes. E.g. for:* Quantifying the benefits of this best practice is hard because it is a project that cannot be compared with others. There are no other transport service providers that use ships (electric nor fossil fuel). However, it is clear that transport by ship costs more than transport by truck. The main reason why

	organisations hire the ship of Mokum Mariteam is for sustainability reasons. Also the ship can transport large bulk goods, preventing the hiring and traffic movements of several trucks. In this way, the ship can compete rather well with trucks. It is the cleanest way to transport goods around Amsterdam's canals and it is the only ship that is able to sail everywhere in Amsterdam. Mokum Mariteam has now 3 full sailing days for partner Icova. In addition it has several minor projects for the municipality, hotels, events and others. They expect that in 2015 more hotels will hire them because they see now that transporting building materials for their hotels by ship is clean and silent. This helps for the stakeholder acceptance of the hotel in the district. The ship has a negligible number of interferences. It is an experimental ship (the first electric transport ship) but because it is based on the canal cruise ships, they profit from these experiences. On routes within Amsterdam's city centre it can compete with trucks on speed. Congestion and other heavy traffic cause delays to trucks very often and the ship does not have these problems. The ship is full electric; also the crane has an electric engine. This means that the ship can sail for 12 hours without CO_2 emissions.		
6.3) Weaknesses	Investments costs are high and the business model was based on 4-6 ships. This would reduce the relative labour costs significantly. Now the project partners Saan and Icova make losses on the ship but it is hoped this will change in 2015. Otherwise they might stop operating the ship. Besides, the municipality likes the idea of an electric ship and they ask Mokum Mariteam what they can do to increase the use of electric ship and other electric transport modes. This is mainly done in order to reduce the number of truck traffic in the city centre. However, the regulations of the municipality are not enforced seriously. Companies who say in their offer they will use clean transport modes often do not implement that element in the project itself. But the municipality does not check this, limiting the market for Mokum Mariteam. On longer distances, the ship is relatively slow, limiting competitiveness on these distances. In the future there might come additional transhipment points to limit the negative effects of the low speed.		
6.4) Implementation steps	What are the different actions necessary in the implementation steps and how long does each step take (estimates)?		
	1. Preparation: … If it is not a competitor: ask Mokum Mariteam for implementation details and details about the ship. They are happy to share it with others. Next: find a company that will build the ship.	2. Implementation: … Make sure you have a proper business model before operation starts. It can be hard to find sufficient clients to operate break-even.	3. Operation: … Continue to work on being known everywhere. An increasing number of organisations is looking for sustainable transport solutions and this is a great way.

	Which actors are relevant in the process? Shipbuilders, governmental organisations that might give subsidies, potential clients
6.5) Process	Saan and Icova looked for sustainable transport modes in order to make their business cleaner. They saw opportunities for transport over water, due to Amsterdam's canals. Therefore they discussed with various shipbuilders the possibilities to build an electric ship. It was important that the ship would have the right dimensions to sail everywhere in Amsterdam and it had to be stable enough to hoist goods from and on the ship. In cooperation with shipbuilder Bocxe, who also build the Bierboot in Utrecht and electric canal tourboats in Amsterdam, they found an optimum for the characteristics a ship like this would need. After construction, it started operation. Saan and Icova look still for more clients but they expect, in the future more transport in Amsterdam will go by electric ship. This because it is an excellent way to avoid the busy road traffic while it reduces emissions significantly.
6.6) Technical feasibility	Is this practice feasible in technical terms? Yes, the ship was custom made for the specific regulations of Amsterdam as well as its canals. This meant that some compromises needed to be made but now it works perfectly for what it is needed for.
Cluster specific information	
7.1) Before-after comparison of distribution systems	Until mid-twentieth century a large share of urban distribution in Amsterdam was done by ship. After that, trucks and vans took over this role. Now, it is shown that an electric (clean, silent) ship can do the same. Mokum Mariteam did not exist before the ship was implemented so there cannot be given a graph of the distribution system before the trial started. Now, with the ship, the logistic process is shaped to the needs of the client. Sometimes goods are brought to the barge at Amsterdam Food Centre, sometimes the goods are picked up near main docking sites etc. They do it on the most suitable location and are very flexible in this.
7.2) Before-after comparison of impacts	The CO_2 emissions are effectively 0, as clean electric energy is used. However, as load, volume etc. vary, indication on kWh or CO_2 per parcel cannot be given.
7.3) Before-after trial description	In cooperation with three shipbuilders, several models were tested in the laboratory. There was chosen for a hull that is more rectangular than usual because of stability issues. The bridges in Amsterdam made that the ship should be rather low. The depth of the canals made that the draft should not be to low and the narrowness of the canals made the ship rather slim. The basis formed 4 electric canal cruise ships. Their hull is similar to the one that was used for this electric cargo ship.

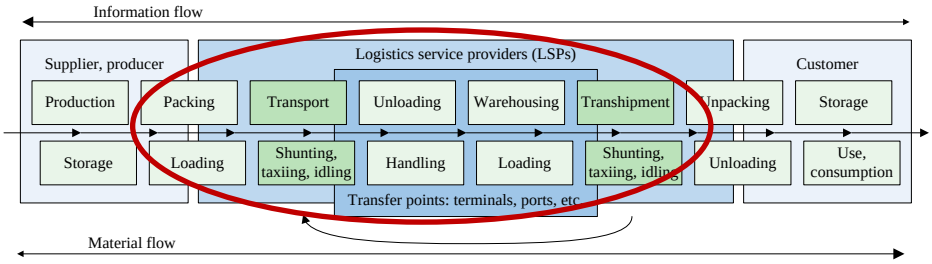
Evaluation of strategic targets





4.6 Citylogistik-kbh – City Logistics in Copenhagen introducing a UCC

Basic information	
1.1) Identification	Citylogistik-kbh – City Logistics in Copenhagen introducing an Urban Consolidation Centre
1.2) Cluster	CL 1 – Urban Freight
1.3) Responsible authors	Philipp Lenz, PTV
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
2.4a) Type of city	☒ Large: >1 million inhabitants ☐ Intermediate: 50,000 to 1 million ☐ Small: < 50,000 inhabitants
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 infra-structure ☐ 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. Citylogistik-kbh will be evolving and creating services together with the clients and other stake-holders.

2.10) Which targets can be supported by the implementation?	*For public actors:* [x] Efficient public spending [x] Ideal utilisation of infrastructure [x] Competitive logistics and transport system [x] Acceptance and influence [ ] Balanced provision of goods and services [x] Increased amenity value [x] Highest safety and security [x] Others	*For private actors:* [x] Increased efficiency / productivity of logistics processes [x] Increased company profitability [ ] Minimisation of financial risks [x] Increased competitiveness [x] Increased quality [x] Image [ ] Increased safety and security [x] Others
	For both actor groups: [x] Limited climate change [x] Reduced emissions [x] Conservation of resources [x] 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) [x] Quality of services [x] Reduced congestions [x] Reduced emissions [x] Reduced climate change [x] Reduced noise pollution [ ] Implementation degree [ ] High level of acceptance of solution/practice [x] Other benefits: Better service, value adding services which can reduce the total costs, put the end user back in charge of their own goods.	
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 environmen-	

	tally 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 competitive 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.
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).
Additional information	
5.1) Consideration for in-depth analysis	Should this case be further considered for in-depth review? ☒ Yes ☐ No
	Information is available and consolidation is a key best practice with high potential.
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	18.10.2014

5.5) Pictures	   
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.
5.8) Opportunities for SMEs	As developer of similar solutions, an SME can be starting such a consolidation centre and distribution service. As user of the service, SME such as shop can benefit from the close proximity of the depot and it quick reactivity.
In-depth information	
6.1) Costs	*What are the (estimated) costs (e.g. investments, operation)* With Citylogistik-kbh, there have only been very low start-up costs, as the manager already had access to smaller electrical vehicles, a warehouse was located at the right place and they did not have to hire new staff to run the business. As this is a very unique situation these low costs should not be expected from other City Logistic projects start-up. For this special case a publicly available business case was used in order to extract important data for the development of such a project. In Copenhagen, two different options were compared: the creation of a new consolidation terminal with all its additional costs was contrasted to the use of an already existing terminal with available staff and infrastructure. The terminal costs for both options are presented in the table below. Some of the objects and tasks in the business case “Use existing terminal” are considered as already purchased, but most of them correlate to the number of customers of the service. For this reason the costs are shown in relation to 100 customers.

Table 2: Costs estimates of 2 Citylogistik-kbh terminal planning options

Terminal Costs	Option 1: Creating a new terminal (for 100 customers)	Option 2: Using an existing terminal (for 100 customers)
Terminal rental incl. Operation	52.000,00 €	4.225,00 €
Consumption (Heating & Water)	10.400,00 €	6.500,00 €
Consumption (Electricity)	6.500,00 €	4.333,29 €
Alarm and guard subscription	7.800,00 €	0,00 €

Telephone, Office supplies etc.	1.560,00 €	1.040,00 €
Electric Truck	3.250,00 €	2.166,71 €
Electric Pallet Truck	812,50 €	541,71 €
Wet scrubber	1.625,00 €	1.083,29 €
Tapes, films, etc.	1.950,00 €	1.300,00 €
Work wear	1.950,00 €	1.300,00 €
IT (Service and license)	3.900,00 €	3.900,00 €
Insurance	6.500,00 €	4.333,29 €
Claims	26.208,00 €	26.208,00 €
Waste Schemes	6.500,00 €	6.500,00 €
Depreciation	10.400,00 €	2.600,00 €
Total	**141.355,50 €**	**66.031,29 €**

The expenses for the distribution and the terminal operation are assumed to be more expensive for the new terminal, since here a lot of equipment has to be purchased while the existing terminal can use nearly depreciated materials. Distribution costs are equal for both options.

Table 3: Expenses of 2 Citylogistik-kbh terminal options

Expense Budget/ year	New terminal	Existing terminal
Distribution	203.112,00 €	203.112,00 €
Terminal	297.074,70 €	216.485,54 €
Total	**500.186,70 €**	**419.597,54 €**

Within the scope of the business model, assumptions in terms of an ABC analysis show that 10% of the customers of Citylogistik-kbh receive more than 20 supplies per week and an average number of deliveries of 25. Cluster B has the same average delivery amount, but only 10 to 20 supplies per week. This group makes up 20% of the clients. The largest numbers with 70% are the smaller assignments with 5 deliveries on average and up to 10 weekly supplies. This customer structure and the conjecture of 100 clients as an average lead to the following income structure.

Table 4: Annual income of Citylogistik-kbh

Income	Amount
Subscriptions	16.536,00 €
Storage Service	9.408,75 €
Additional service	39.000,00 €
Carriers	147.420,00 €
Special Customers	0,00 €
Total income	361.188,75 €

The final outcome of the compilation of important figures looks as following.

Table 5: Overall budget and balance

	Establish new terminal	Use existing terminal
Expense Budget	500.186,70 €	419.597,54 €
Revenue per year/ Total income (100 customers)	361.188,75 €	361.188,75 €
Break Even Point	After 150 customers	At 150 customers
Accumulated deficit (0-150 customers in 3 years)	-521.107,62 €	-182.767,82 €

The business case clearly shows that if the project wants to be profitable within 3 years, they need to acquire more than 150 customers and for that the economic value of the whole concept needs to be made more visible and transparent.

- *What financing is presently applied/planned (partnership, private, public funding)*

The Danish Transport Authority was applied for co-finance of the demonstration project in 2012. The money was granted in 2013 where the Demonstration project started in June. It will run until 2016. The private partners in the demonstration project (the company Citylogistik-kbh ApS and TINV – the Transport Innovation Network only gets 40 % funding. The universities (Copenhagen Business School and The Danish Technical University) get 100 %.

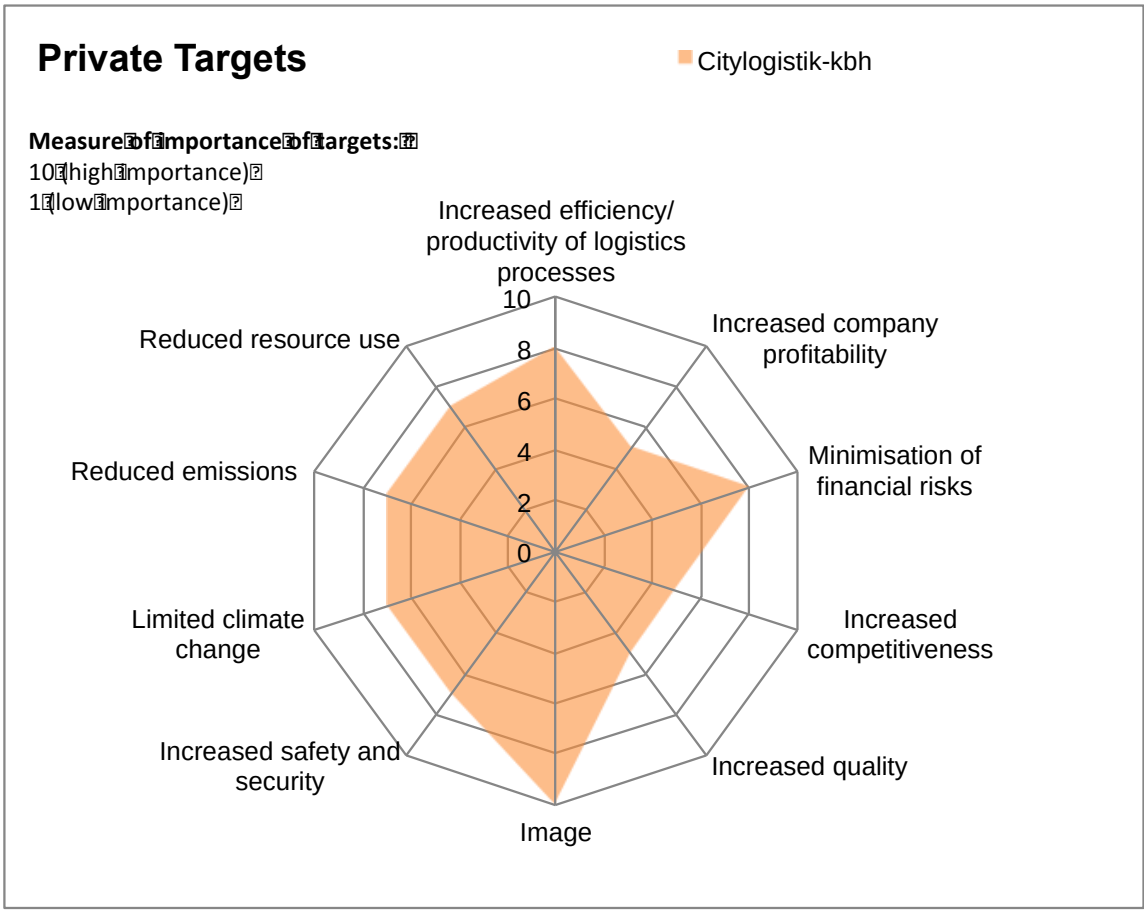
6.2) Benefits / Strengths	**General benefits with City Logistics** • A reduction of trucks in the City Centre which provides less congestion in specific areas. Less pollution in air quality and noise. More traffic safety and a more attractive City Centre for citizens, guests and business. Better use of space in the City Centre. A more sustainable transport alternative. • The greater the volumes through City Logistics get, the higher are the above mentioned benefits. **Benefits for the potential users of City Logistics:** **Goods receivers:** • With coordinated and planned deliveries at a higher service level there is a potential reduction in time used, paid man hours, better possibilities to plan the time and allocate resources for the tasks in the shop. • Less damaged and stolen goods in connection with the goods deliveries. • A more organised and tidy shop with fewer or no big trucks in front of the shop gives the possibility of more focus on the shops client and better sale opportunity. • The shop keepers can also promote their use of sustainable transport. **Transport companies/hauliers:** • A reduction in time and money spent on delivering only one or few deliveries in the City Centre (the last mile delivery is the most expensive part). • Access to provide better service to the goods receiver with the use of Citylogistik-kbh. • Better service for their clients (the goods receivers). • Promoting the use of sustainable transport which is often a part of the company's CSR profile. **Authorities:** • The same potential reduction in costs as mentioned for other goods receivers. • Promoting sustainable transport in the City Centre by using the concept the Authorities request other to use.
6.3) Weaknesses	• *What are the main weaknesses of the project, concept, strategy, initiative?* From running City logistics in Copenhagen for little over a year now – we can observe that even if the potential clients find City Logistics a useful concept – some might be hesitating to use it for the following reasons: • The price – they are not convinced they can actually reduce their costs in other areas such as saved man hours, time, more focus on their own clients, a more tidy shop and better used space in their shops. • The risk of changing the existing structure of transport and logistic with a new concept – some are not willing to take that risk, others will like to see the Citylogistik-kbh company dealing with other big clients before deciding to change themselves. • The transport companies perceive City Logistics as a treat. They do not want to deliver goods to the UCC. • From the knowledge today, the main weakness of the demonstration project is that it had no committed partners who could use the City Logis-

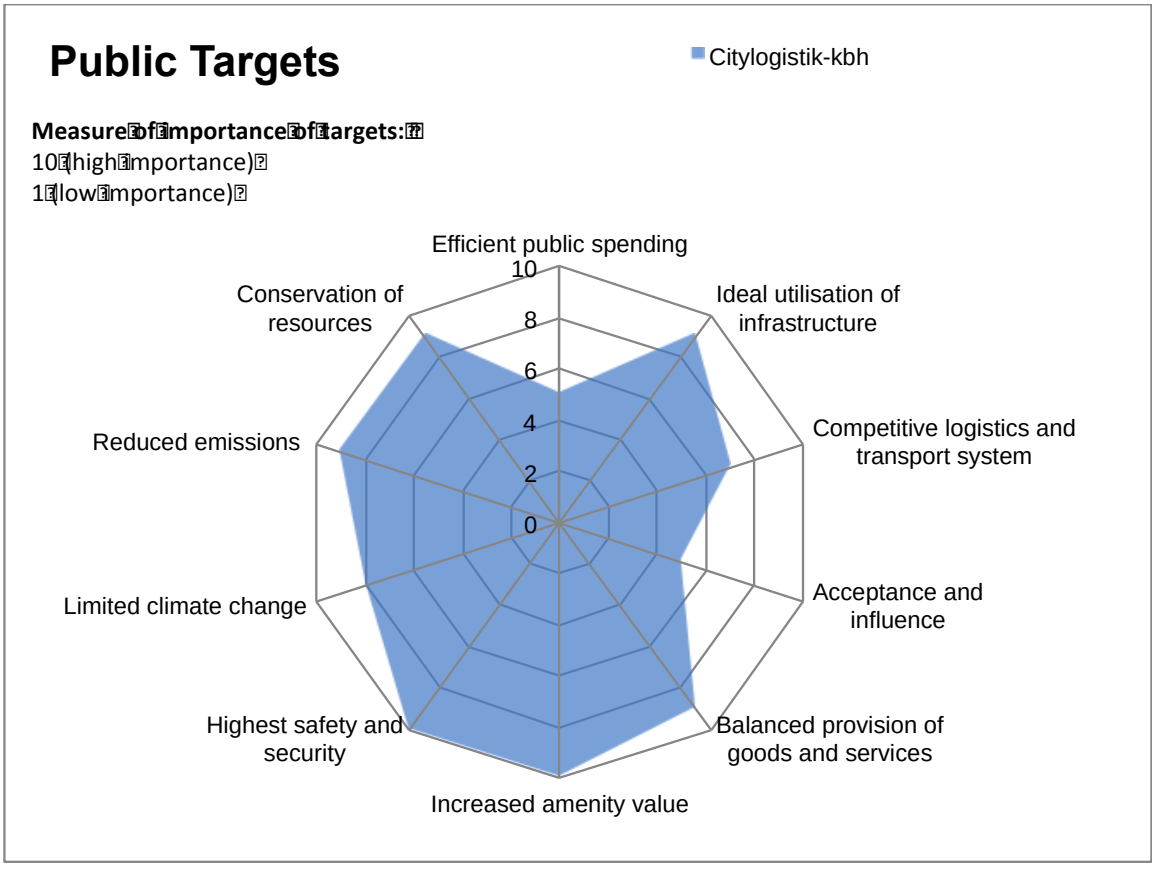
<table>
<tr><td></td><td colspan="3">tics service from day one and by doing that demonstrating and sending the signal for other potential users that the City Logistic concept is not a risky business to use.
• Citylogistik-kbh in Copenhagen has learned that it is essential to the introduction of City Logistic that at least the Municipality and preferable one transport company use and work with the concept from day one in order to give credibility and basic volume to the concept.

• What are the main risks?
The same as the above mentioned.
In addition, the Citylogistik-kbh in Copenhagen is demonstrating electrical vehicles. Various difficulties have been encountered in introducing these vehicles for City distribution. They cost more: An electrical vehicle that can transport the same amount in volume as a diesel driven (ex. Iveco) is subject to a special permit for goods transport for trucks over 3500kg. The electrical vehicle surpasses the 3500kg limit because the batteries in electrical vehicles are extremely heavy (approx. 1000kg). Citylogistik-kbh has tried to get a dispensation for the demonstration project from the national authorities because this brings even more extra cost (special education 3.300 Euro and a bank guaranty of 20.000 Euro) to use the electrical vehicle that the concept wants to demonstrate. But there are not willing to do so.
In general, it is a main problem that authorities/municipalities will like to introduce the change to more sustainable transport in urban areas but are not willing to provide changes in the existing framework to promote and/or give incentives for the expansion of more sustainable transport.
• Are there undesired secondary or external effects?
No</td></tr>
<tr><td rowspan="3">6.4) Implementation steps</td><td colspan="3">What are the different actions necessary in the implementation steps and how long does each step take (estimates)?</td></tr>
<tr><td>1. Preparation:
In Copenhagen there was a 2 year analysis and concept development phase. (2011-2012)</td><td>2. Implementation:
The concept was implemented and initiated from day one of the demonstration project (June 2013). But in general you could argue that the 3 year demonstration project is a sort of an implementation phase as Citylogistik-kbh is now testing and adjusting the concept in practice.</td><td>3. Operation:
In Copenhagen implementation has not been separated from operation – these are both part of the demonstration project. But Citylogistik-kbh is adjusting the concept during this period – so it might be argued that the final operation will be ready in 3 years when the demonstrations period ends.</td></tr>
<tr><td colspan="3">Which actors are relevant in the process?
Citylogistik-kbh has included all stakeholders in the demonstration phase. They try to engage them in co-creating the concept.</td></tr>
</table>

	There are essential actors/stakeholders who as a minimum must be involved as closely as possible. From Citylogistik-kbh's experience they would recommend that these stakeholders are committed partners in the demonstration project. These essential partners are: • the municipality (committed to using the concept) • A transport company/haulier (committed to use the concept for a trial period) • a major goods receiver (if possible) These partners/actors are in addition to the already existing projects partners. All actors/stakeholders, who have a potential effect on City Logistics or who will be affected by the introduction of City Logistics, are relevant actors/stakeholders. In Copenhagen, Citylogistik-kbh has formed an advisory board to work with these stakeholders continuously throughout the project period. The following actors in this process are relevant: • Citizens in the City Centre • Business in the City Centre • Land and building owners in the City Centre • Administrators of shopping centres or galleries • Local authorities (municipality) • Transport companies/hauliers • The project partners
6.5) Process	Please see the above mentioned strength and weaknesses identified in the startup of the demonstration project. Citylogistik-kbh already exchanged knowledge with other City Logistics startups or existing City Logistics companies in order to transfer and share the experiences to ensure even better results for all City logistics concepts in the future.
6.6) Technical feasibility	*Is this practice feasible in technical terms?* Yes it is – but there is essential help that could be provided from local and national authorities to provide a better framework to test and use the new technology.

Evaluation of strategic targets





5 Synthesis within the cluster

5.1 Topics covered

Table 6: Coverage of CL1 Best Practice cases inventoried in 2014 according to BESTFACT topics

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

The most frequent types of activity are the low emission technologies, innovative vehicles, B2B and B2C services, innovative operational solution and consolidation centres.

For 2014, we have used the new Cluster 1 specific, slightly summarised typology in order to group the urban logistics activities into different categories. The Figure 1 illustrates the number of actions performed in the cases. The main value is expressed as percentage of activities that are represented by the 11 Best Practice Inventories (section 2 above) and the Good Practices listed by the partners.

In this report, more than 80% of the cases relates to clean vehicle use, and 50% to consolidation or City Logistics schemes that include the deployment of a UCC.

All Cluster 1 topics have been covered from the 11 inventories performed in 2014 (Table 6a). No topic was missing. These groups of activities are also covered in Cluster 2 and Cluster 3. Intermodality, green logistics and IT application are widely covered in this Cluster 1 2014 report.

Table 6a: Coverage of BESTFACT topics for each case

Case ► / Topics ▼	1	2	3	4	5	6	7	8	9	10	11
Infrastructure and Technology											
Access to transport networks, infrastructure and nodes			X	X	X		X				
Freight consolidation and transhipment	x	X	X	X	X			X	X		
Implementation of low emission technologies	X	X	X	X	X	X	X	X	X		X
IT-technologies and solutions (for management and administration)			X	X							
Innovative vehicles, vessels and equipment	X	X	X	X	X	X			X		X
ICT, transport optimisation			X	X	X						
Organisation and Cooperation											
B2B solutions, cooperation		x	X	X	X	X		X	X		X
Competitive aspects		X	X	X	X	X	X	X			
A2A			X	X							
B2A, A2B			X	X	X				x		
Business models			X	x			X				
Operations and Services											
B2C	X	X	X	X		X	X	X	X	X	
Innovative operational solutions	X		X	X	X		X	X	X		
Value added services, development/extension of services			X	X				X	X	X	
Service quality and sustaina-			X	X		X		X	X		

bility agreements/certification											
Transport management, fleet management	X		X	X	X			X			
Regulations and Policy											
Access rules and restrictions of urban areas	X		X	X	X						
Land use and spatial planning		X	X	X							
Infrastructure financing			X								
Environmental standards and policy			X	X	X						
Interoperability and standardi-sation			X	X							
Safety and security			X								
Knowledge, Tools & Methods											
Modelling and forecasting			X	X					X		
Data collection and statistics			X	X	X				X		
Education and training			X								
Working and implementation guidelines			X	X	X						
Monitoring and benchmarking of processes			X	X	X				X		

In Table 61, Cases are numbered from 1 to 11 according to overview on page 1.

5.2 Strategic targets covered

Table 7: Coverage of cases according to strategic targets of BESTFACT

Targets supported by Cluster 1 cases	***Number of inventories***
Public sector	
Efficient public spending	4
Ideal utilisation of infrastructure	8
Competitive logistics and transport system	4
Acceptance and influence	6
Balanced provision of goods and services	4
Increased amenity value	3
Highest safety and security	3
Others: Attractive inner-city	2
Private sector	
Increased efficiency / productivity of logistics processes	8
Increased company profitability	7
Minimisation of financial risks	2
Increased competitiveness	6

Increased quality	7
Image	10
Increased safety and security	2
For both actor groups	
Limited climate change	10
Reduced emissions	11
Conservation of resources	9
Others? Reduced congestion, low noise, etc.	3

Source: Section 3 Inventories and Section 4 in-depth reviews, see above

5.3 Regional coverage

As in previous reports, the main characteristic of an Urban Freight case is that it has been developed 'bottom-up'. The solutions are coming from separated initiatives that have not been centrally planned or coordinated together. There is no international initiative in 2014.

Table 8: Coverage of cases according to regions and geographical entities

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

Source: Section 3 Inventories and Section 4 in-depth reviews, see above

The overview analysis presents the same information that was in the inventory, but in short form.

Table 9: Overview analysis of 11 Best Practice Cases for Urban Freight Transport in Europe, inventoried in 2014

Name	**Main characteristics**	**Costs**	**Data availability**	**Impacts & benefits**	**Barriers**	**Transferability**	**Success factors**
La Petite Reine	UCC and clean vehicle scheme	Lower costs for operators	Congestion, emission	Lower congestion & emissions	Acceptance of shops	Confirmed for France	Good cooperation
Beaugrenelle UCC	City centre UCC and clean vehicles	Profitable	Started since 1 year	Lower pollution, traffic saving	Additional handling at UCC	Confirmed	Good location; good planning of facility
Smart Urban Logistics	City Logistics policy	-	Policy	Lower emissions, quality of service	Early stage, Pilots not finalized	Given	Applications and good pilots
EMILIA	Electric freight vehicle scheme	-	Policy	Lower emissions, noise	Costs	Given	Uptake by operators
LOGeco?	City Logistics	Low	Operations	Lower emis-	Handling at	Given	Uptake by

	policy model			sions, noise, & congestion.	transship-ment point		operators
Electric Removal Truck	2 electric trucks for removals	High	Costs, oper-ations	Lower emis-sions and noise	Costs	Given	Image
Combipakt	Taxi deliveries	Low	Started since 1 year	High efficiency	No monitor-ing	Given	Uptake by clients
Mokum Mariteam	Urban barge service	High	Costs, oper-ations	Lower emis-sions, noise, & congestion.	Handling, costs	Given if waterway is available	Good clients
Citylogistik-kbh Copen-hagen	UCC scheme	High invest-ment	New depot and new fleet, opera-tions	Low emis-sions, noise, congestion.	High number of customers needed	Given, but not imple-mented	Acceptance, cooperation, management
Kautra	Combine passenger & freight by bus service	Low	Vehicle operations	High efficiency	Space availability	Given	Uptake by clients, opera-tors, image
Mey-er&Meyer	Electric truck	High	Vehicle operations	Lower emis-sions and noise	Costs	Given	Image, good client

Source: Section 3 Inventories and Section 4 in-depth reviews, see above

5.4 Transversal analysis and concluding remarks

Understanding why and how a solution works, and using a typology of cities

It was mentioned in BESTFACT review that a typology of cities should be introduced into the analysis. Following Table is presenting the size of the cities in which the 11 BP solutions have been implemented.

Table 10: Coverage of cases according to size of cities

Size of city	**CL1** inventories
Large > 1 mio inhabitants	9
Intermediate < 1 mio & > 50,000 inhabitants	4
Small < 50,000 inhabitants	3

Source: Section 3 Inventories and Section 4 in-depth reviews, see above

Most of the cities mentioned are large cities above 1 mio inhabitants. But the explanations are not given, why a certain solution could or could not work in a smaller city. On many occasion, business leaders and decision makers were asked about the usefulness of the Bestfact case studies. Their answers tend to show that the understanding of the working mechanisms of a solution is the key information that is needed by entrepreneurs and public sector decision makers. Why a solution works and how it works, both technically and from the management point of view, is by far the most important point.

The size of the city, in any case, was never a crucial point for decision making.

Understand the mechanisms of a Best Practice helps the transfer

The understanding (why and how) is also needed for the transfer of solution, in order to understand how to apply the solution and adapt it to the particular situation of another business or another city.

The explanations of the inventories and in-depth give enough background to understand what the mechanisms are, which make the solution work.

This enables the business to replicate the solution and eventually adapt it to their specific business conditions.

ANNEX : Index