



D 2.5 | Small scale demonstrations: key findings and conclusion across all sites, scope for replication and scaling up

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1. LIST OF TABLES, FIGURES AND ABBREVIATIONS

1.1. List of tables

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1.2. List of abbreviations

This table provides an overview on all abbreviations used in this document.

Abbreviation	Full name Explanation
CO ₂	Carbon dioxide
KPI	Key performance indicator
PA	Public Authorities
UCC	Urban Consolidation Centre
UFT	Urban Freight Terminal
UDC	Urban Distribution Centre

Table 1: Abbreviations used in this document

2. ABOUT SMARTSET

Transports of goods, both on long distances and within cities contribute to a substantial part of the total emissions generated from the transport sector, as well as congestion. Up to 20% of traffic, 30% of street occupation and 50% of greenhouse-gas emissions are generated by freight. Toxic exhaust emissions e.g. particles from city distribution vehicles is also a local health issue.

Yet freight and distribution schemes are often structured in traditional ways, based on vertical solutions with individual solutions. These systems lead to sub-optimisation of freight transports, with low load factors and an unjustified amount of tonne-kilometres generated by the vehicles used. The need for more efficient solutions that leads to less transport kilometres and a more sustainable economic model is obvious. The latter is foreseen to be the key factor of a long-term success in implementing a working model for urban freight transport and thus supply all involved stakeholders with the correct incentives to change their distribution networks.

The SMARTSET project will develop and show how freight transport in European cities and regions can be made more energy-efficient and sustainable by a better use of freight terminals. To reach this overall goal, the project will provide examples of good practice that can support cities, regions and countries to contribute to the European Union „20-20-20“ targets¹ for reduction in carbon dioxide emissions and improvement in energy-efficiency.

SMARTSET targets	Reduction by 2016	Reduction by 2020
Reduction of CO ₂ emissions in tonnes	9,063 tonnes per year	31,346 tonnes per year
Reduction of energy consumption in tonnes	3,096 tonnes per year	10,303 tonnes per year
Reduction of energy consumption in GWh	36 GWh per year	120 GWh per year

Table 2: SMARTSET targets during project duration (by 2016) and beyond (by 2020)

SMARTSET is a project, co-funded by the Intelligent Energy Europe Programme of the European Union and is composed of 14 partners, coming from Austria, Germany, Italy, Sweden and the United Kingdom. It will run from 01.05.2013 until 30.04.2016.

¹ The climate and energy package is a set of binding legislation which aims to ensure the European Union meets its ambitious climate and energy targets for 2020. These targets, known as the "20-20-20" targets, set three key objectives for 2020:

- A 20% reduction in EU greenhouse gas emissions from 1990 levels
- Raising the share of EU energy consumption produced from renewable resources to 20%
- A 20% improvement in the EU's energy efficiency

3. INTRODUCTION

The present Deliverable has the aim to present the city logistics initiatives in the SMARTSET application sites, focusing on their outcomes.

In the general framework of Smartset, this deliverable accounts for the findings of the application of tests and small scale demonstrations in terms of their replicability and scalability within the corresponding contexts. Deliverable 2.4 instead examines the success (or lack thereof) of the business models applied in such initiatives, while classifying them into a comprehensive model for describing in general the UFT-based city logistics initiatives and analysing their critical factors.

It is to be highlighted that this deliverable is elaborated and finalised at a time during the SMARTSET project when not all applications have already been completed or even implemented; in such cases, the conclusions concern the activities done so far; furthermore, as per original plan, three application sites were not expected to implement actual demonstrations but to draw up. Therefore, only a small part of the analysis involves completed demonstrations (namely, those in the so called “leader sites”).

The approach of this analysis draws from the WP2 activities aimed at defining the action plans for the application sites; therefore it has entailed the monitoring of initiatives against the key activities and milestones envisaged by the action plans themselves (cfr. Deliverable 2.3).

The report therefore illustrates the outcomes of such activities with one chapter dedicated to each site; and it is concluded with a horizontal review of the findings across all sites.

4. GOTHENBURG | SWEDEN

4.1. Description of the initiative

The Gothenburg region is the main logistics hub of Scandinavia. The inner city of Gothenburg consists of a quite compact area with few residents and a large variety of different businesses, where shops and restaurants dominate the ground level. Clean vehicles and consolidation schemes have since long been in focus regarding solutions for developing a cleaner, safer and more attractive city, as well as adapted legal framework.

The project envisages the following activities:

- development and set up of an UFT in the city centre to shift transports from individual deliveries by regular trucks to consolidated freight in order to significantly reduce the number of heavy vehicles in the city centre;
- development of a business model to ensure that the micro terminal and the distribution to the city centre will be able to run on a free commercial basis;
- analysis of the potential market of a micro terminal scheme, including a mapping of delivery times, volumes etc. for goods to shops in the area to be covered by the UFT;
- analysis of how incentives and regulations regarding freight distribution can be modified in order to strengthen the UFT concept and make urban distribution scheme more economically sustainable;
- a study of vehicle movements in the actual city centre and from the outskirts of the city into the centre;
- development and introduction of a new legal framework for minimizing congestion and to separate goods distribution from pedestrian traffic in as large extent as possible. The regulations will encompass both restrictions and incentives to achieve a solution with broad support of stakeholders. It also intends to affect the transport demand and flow in favour of the UFT.
- introduction of electric powered freight vehicles for last mile distribution in general, and as operating vehicles at UFT's in particular;
- pro-active work to promote electric vehicles, hybrids and CNG vehicles as well as renewable fuels for distribution on a local level;
- development of value adding services for UFTs;
- extension of the freight network to further discuss and develop issues regarding clean vehicles, UFTs, regulations and incentives;
- networking and dissemination in order to increase knowledge and generate motivation among stakeholders to participate in development of the solutions included in SMARTSET.

4.2. Outcomes of the key activities

- 1. City deliveries** Fiskleveransen, whose startup was previously planned for March 2014, was implemented with a slight delay in November 2014 and is running since then. In June 2014 a decision was made to put handling of recycling material within Stadsleveransen on hold, due to lacking of economic prerequisites. Two value and benefit analysis were performed, one related to the benefits that shops could accrue from the service (finished November 2013), and one regarding the logistic effects of the operation (finished October 2013). The analysis included a comparison between the economic prerequisites for different vehicle types that was performed in May 2014. The logistic effects analysis was further developed into a second version, and finally presented in August 2014.

In order to extend the knowledge about the incentive and regulation systems aiming at detecting the best way to foster the project a pre study was performed during the autumn 2014, with a slight delay from the forecasted due date of June 2014. A first proposal of incentives and regulatory scheme was developed in February 2015, and the final version is expected to be completed as this deliverable is being written.
- 2. Hub operations** The terminal of Stadsleveransen, the city logistics service, was located in a facility in Gullbergsvass since March 2014. It had to be relocated in July 2015 to another part of the same terminal building due to construction work in the area. The company Paketlogistik took over the responsibility as operator for Stadsleveransen in February 2014. At the same time a new PDA based ITS-system was implemented for all goods handling within Stadsleveransen and a bigger vehicle (Alké) with capacity of towing up to three trailers was implemented. Since then the capacity has been further increased with the “old” vehicle put back into service, as well as with cargo bikes.
- 3. Networking** The third key activity relates to networking and dissemination aiming at increasing the knowledge and at generating motivation among stakeholders to get involved and participate in the development of the Smartset solutions.

A stakeholder workshop with 20 selected participants from different stakeholder groups was held on 3rd April 2014 in order to discuss on how to improve the freight distribution in the city. The action continued with regular meetings of the freight committee, held three times per year that involved an average of 20 participants per meeting.

4.3. Main findings and scope for replication and scaling up

The Gothenburg experience featured a **very good analysis of the market** and of the potential solutions, performed in parallel with preparatory activities with the stakeholders aiming at understanding their needs, defining the system requirements and taking them on board, could determine the success of a project. The ex ante feasibility studies and economical analysis, together with the step-by-step approach used in the implementation of the project by phases helped the success of the initiative.

The promoters of the initiative envisage the start of a new service dedicated to the transport of cheese in the next few months, making it evident – together with the increased capacity given by the addition of a bigger vehicle – that the approach and the mix of competences, assets in Gothenburg has **made the initiative scalable**.

However, the continued need for public subsidies to the logistic operator suggests that **this condition cannot easily be overlooked at the least in the starting years**. In the first year this initiative had its operating costs wholly covered with the support of Real Estate Associations; after that the Municipality took over in providing coverage of operating cost (such as the rent of the facility and of vehicles), reaching a peak of 70% in 2014. Since then, the share of public subsidies has been decreasing; currently it is around 33% and the objective is to remove it completely in the next years by adding capacity and further services; the public support will soon translate from monetary subsidies to the application of a regulation introducing time windows for downtown deliveries, which will allow the application of higher charges for the city logistics customers.

5. NEWCASTLE | UNITED KINGDOM

5.1. Description of the initiative

Newcastle University lies at the heart of a city with a population of circa 300.000 within a conurbation of circa 900.000 which lies on both sides of the river Tyne. The University main campus is integral to but separated from the main city. The scope of the work is the main campus only, since it can be clearly isolated, whereas many other sites have dual ownership. The University has over 144 schools/departments institutes and over 80 buildings. There are around 25,000 staff students, making it the second largest employer in the city.

The project envisages the following activities:

- Development of a sustainable campus which balances open liveable spaces free of intrusion and the need to supply goods and services to the campus;
- work with local freight partnership;
- development of a Coherent Campus Delivery Service Plan;
- investigation of possible replication;
- development and acceptability testing of the incentives/regulations mix;
- vehicles evaluation;

5.2. Outcomes of key activities

1. Establishment of internal consolidation terminal for the University (at Team Valley)

An internal consolidation scheme was developed over a period of many months, together with Clipper Logistics, a partner in another EU project.

In January 2014, the volumes available for the consolidation scheme were estimated, making sure there is enough volume at Newcastle University to justify the scheme. The data come from SAP Data Analysis & Refinement identified Vendors (Suppliers) who made fewer than 4 deliveries a month. It was assumed that these were suppliers who were least optimised and therefore benefited the most from the scheme. This produced an estimation of 330 packages being delivered on average a week or approximately 17.500 a year. Assuming that supplier introduction to scheme will be phased; Initial volumes suggested a daily trip from Clipper to Newcastle University, aiming for same day turn around.

Precise conditions of operating the scheme were negotiated with Clipper Logistics, incl. the vehicle operations, the use of the consolidation/warehousing centre, human resources involved and the use of Clipper's and University's IT systems.

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- 2. Strategic level involvement at the board level in promoting clean urban freight at Newcastle University premises through Coherent Campus strategy**
- Two meetings of Newrail (the unit of Newcastle University who proposed and devised the scheme) with other University stakeholders like the Estates (responsible for the real estate incl. parking, unloading, security and access to buildings), the Purchasing (responsible for all centralised procurement of all goods for the different University departments, and consequently RELATIONS WITH SUPPLIERS), and the IT services (responsible for the internal procurement e-service and potential integration with an IT system of the external logistics service provider) were held. Closely working with purchasing staff, suppliers, estates management and end users, suppliers were contacted and asked first to identify any problems with moving to external consolidation. Some suppliers, such as Office Depot or RS Components, had such high levels of service that they were excluded at this stage. Those where all parties agreed were instructed to deliver goods to an external location - Clipper Logistics at Winyard. This process involved careful discussion with the suppliers, consultation with key internal customers, and monitoring to look out for problems.
- 3. Supporting different organisation/schools across the University to adopt internal consolidation centre**
- It was known from the beginning of the scheme that not all purchases of the University can enter the scheme (e.g. food was excluded from the start) nor can all selected enter the scheme at the same time, so the university's purchasing data was obtained and analysed. Starting slowly with limited suppliers in September 2014 and ramping up in February 2015, it was seen an eighteen fold increase in parcels delivered via the consolidation approach, with an ongoing programme converting five suppliers per week, every week, throughout the pilot period.
- 4. Supporting different organisation/schools across the University to adopt electric vehicles as its main fleet strategy**
- Newcastle University announced its will to purchase a truck for the scheme and one offer was received. The conditions were very good: the truck was ex-demonstration and the 80kWh battery included in the reasonable price while additional 40kWh was installed and rented to NU in order to check its suitability.
- In August 2014 the 7.5t Smith Electric Newton truck was delivered with 120kWh battery and in September 2014 it started operation within the scheme.
- 5. Monitoring progress made after the adoption of consolidation terminal strategy**
- The scheme data collected over the first 6 months of operation was analysed. From less than 50 parcels delivered in October 2014, the deliveries reached 300 parcels per month in February 2015 and were expected to grow to 900 by July 2015. Once analysed the data, the Board of Newcastle University decided to continue the scheme after the EU funding has run out.
- 6. Networking with other big employers**
- Meetings with Newcastle City Council, Northumbria University and the

in the North East of England to transfer knowledge and knowhow of promoting clean urban freight

National Health Service with the view to their potential involvement in the future expanded version of the scheme (increasing the scale) were held in December 2014, March and September 2015.

5.3. Main findings and scope for replication and scaling up

The business model implemented in Newcastle is peculiar: it does not envisage the consolidation of goods to be delivered to different shops in a particular area, but - at this very first stage - it is conceived as internal logistics of the University.

Such type of **model basically replaces a multitude of customers of the service with a unique subject, which represents/collects the interests of multiple users** located in the same area that normally manage directly with the forwarder/logistics operator for the delivery of their goods, and that within such city logistics initiative, instead, partly delegate this activity to the subject, who is willing to pay for the city logistics service to be performed.

This situation can occur in contexts similar to a University, such as a City Administration district, a Hospital (and such subjects are actually already the target for scaling up the service in Newcastle, as they are also in close proximity to the University).

A main finding that can be helpful in all the other city logistics initiatives, whatever is their scope and operations: a supply chain analysis should be performed and the best category of supplier to be included in the scheme or to be the addressee of the scheme has to be identified. In Newcastle suppliers who made fewer than 4 deliveries a month were assumed to be the least optimised and therefore those who could gain the most of the benefits from the scheme. The scheme, therefore, started including them and excluding, for the first stage, the suppliers with high levels of service.

6. PADUA | ITALY

6.1. Description of the initiative

With a population of 214.000 inhabitants Padua it is one of the biggest cities in the Veneto region. The delivery of freight in the local LTZ, having a size of 830.000 m², is operated by the urban distribution service named “Cityporto - Consegne in Città”. The manager is Interporto Padova S.p.A. who also manages the local Freight Village, a Public-Private Partnership whose major stakeholders are the local public bodies in the area. Since 2004 Cityporto delivers the goods in the city centre by means of eleven vehicles, which are LNG-powered (Liquified Natural Gas). After the start-up phase, Cityporto now performs 100.000 deliveries per year (2012) on behalf of about 50 customers.

The project envisages the following activities:

- integration of parcel delivery in Cityporto range of services;
- integration of perishable goods delivery in Cityporto range of services;
- extension of delivery services to non-urban areas;
- adoption of a new tracking and tracing system for urban deliveries;
- through an agreement between rail operators and Cityporto, integration with the rail-road transshipment activity currently performed in Padua intermodal terminal to explore possible development areas to be included in the business model;
-

6.2. Outcomes of key activities

1. Integration of the delivery of different kind of goods (parcel and perishable goods) in Cityporto Regular running of the deliveries of express parcels with a Cityporto potential customer, a well-known operator of the express segment, started with defined procedures (also with IT equipment support) aiming at managing the deliveries according to the performance quality indicators required by the customer.

2. Adoption of new tracking and tracing system The second milestone was related to the introduction of IT equipment suitable to support express service and including digital signature capture. The Cityporto Management System is composed of three parts: 1) software application in the palm cell used by the driver to register the deliveries; 2) IT equipment installed on the vehicles for WI-FI communication with the palm cell used by the cityporto driver. This equipment enables the download of the cargo list (borderò) form the UDC and then sends to the UDC the deliveries to be registered. The communication between Cityporto UDC and GPS equipment for localization is enabled since 07.30 to 19.30; 3) Website for the tracking of the deliveries and monitoring of situation of the delivery status.

In April 2015 a new service of deliveries of goods at controlled temperature and frozen goods started. The customer is a mass market actor of the alimentary logistic chain and the supermarket is located in the pedestrian zone of Padua. A refrigerated lorry powered by methane gas (6.5 tons) equipped with hydraulic tail-lift, deliveries with a daily trip (6 days/week) about 1400 kilos of foods (perishable and not).

- 2. Extension of deliveries to non-urban areas (Abano and Montegrotto)** The service was extended to the spa area of Abano, Montegrotto and Battaglia terme. It is now running regularly with deliveries performed with a dedicated truck of 6.5 tons CNG, which consolidates the deliveries of 12 transport operators previously doing the same deliveries with diesel trucks.
- 3. Inclusion of the rail-road transshipment activity** The action plan envisaged the delivery of the goods addressed to the centre and arrived by railway from Poland in the container terminal managed by IDP by means of Cityporto service. Interporto Padova, after having delayed the activity of rail-road transshipment during the first two years of the project life, has definitely renounced to start a pilot phase of shifting goods from the railway terminal to Cityporto UDC because the train to Poland was cancelled due to lack of goods to be loaded in the commercial stop in the terminal of Padua.

6.3. Main findings and scope for replication and scaling up

The strength of the Cityporto strategy is the **“step by step” implementation concept**. New areas (Abano, Montegrotto, Battaglia Terme), new segments (express deliveries, perishable goods, drinks and reverse logistics) have been implemented gradually and after a careful planning. The initiative has therefore shown to be scalable in terms of addition of both new types of customers and new types of services.

The introduction of IT systems enabling the development of new services, like the express deliveries, was also a crucial point to consider in the implementation of operations.

The failure of the rail-road transshipment activity suggests that the actual demand is the only sensitive condition, which the Cityporto managers have little to no possibility to control, capable to undermine the expansion of the activities in this framework.

Otherwise, Cityporto is a solid initiative which has been able to **exploit the opportunities given by the contextual activity of a freight village**. As such, the initiative has a lot of potential to be scaled up further, expanding its market for already existing services and (exploiting its location, equipment and economies of scale) adding new types of service, even unrelated to the freight village.

7. BERLIN | GERMANY

7.1. Description of the initiative

Today Berlin already has a freight transport strategy to reach ambitious political objectives and timetables, concerning air quality, climate protection and Berlin's ambient noise directive – the “Integrated Commercial Transport Concept Berlin”, adopted by the House of Representatives in February 2006. It defines several main action fields, for example concerning privileges for urban freight transport or the conservation of necessary urban rail infrastructure and logistic fields - such as Tempelhof. The main goals are the meeting of defined ceiling for PM₁₀, PM_{2.5}, national NO₂, the reduction from 20% up to 30% by 2020 of the emission responsible of the climate change and the implementation of the noise directive.

The former freight train station Tempelhof is and was a crucial part of many strategic plans for Berlin's future development. Ensuring we have the right goods, in the right place, in perfect condition, helps to ensure the vitality and continued prosperity of Berlin. But it comes along with significant, especially environmental costs. Tempelhof as an urban consolidation centre can become an essential part for a more sustainable distribution of goods in Berlin and a powerful example for “green urban logistics”.

The project envisages the following activities:

- support to the current developments and foster existing potentials for new logistics concepts in Berlin, focusing on terminal solutions in an integrated urban setting;
- plan and conceptual development of a terminal scheme for the location of Tempelhof including consideration of large e-trucks (up to 7.5 tons);
- provision of experiences from German “e-truck showcase” projects;
- development a business model for feasible and sustainable operations;
- improvement of the long-haul rail / road supply of the terminal regarding energy consumption;
- assessment of different incentive strategies for the terminal Tempelhof;
- communication with all relevant local stakeholder groups.

7.2. Outcomes of key activities

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|--|--|
| 1. Elaboration of a comprehensive business model for the terminal of Tempelhof, including the improvement of the long-haul rail / | <p>The process related to the elaboration of a comprehensive business model for the terminal of Tempelhof, including the improvement of the long-haul rail / road supply of the terminal, was performed in different phases, including a discussion with the potential operator, possible customers and experts.</p> <p>The main key for success would be the low total cost over the whole supply chain that can be mainly achieved through close proximity of the terminal to senders and recipients of goods.</p> |
|--|--|

- road supply of the terminal** In a second phase, calculations showed that the business model is sound, but electrification of last rail stretch from “Halensee” to “Tempelhof” is a necessity, otherwise costs of hauling a train by a diesel locomotive would be prohibitive.
- 2. Terminal Planning and Location** A first asset list was drawn during the business model elaboration and resulted in 1 reachstacker, 1 shunting locomotive and 2 x 350m loading tracks. The list was then revised through potential operators that agreed with asset list.
- 3. Networking and marketing for Tempelhof** The networking and stakeholder consultation methodology adopted envisaged only two to three-person conversations, as this is the most promising method to get real information and honest opinions. A number of additional conferences were attended and presentations were held to market the general idea. Further conference-attendances are planned.
- 4. Introduction of e-trucks** The description of operational parameters of e-trucks generally shows very positive and promising results. Purchasing costs are still at least 50% too high, therefore state subsidies would be necessary.
The analysis about the operational scenarios for e-trucks was planned for second half of 2015 and had not been completed during the elaboration of this deliverable.
- 5. Incentives for e-trucks** The Guidelines Incentive for e-truck introduction was issued. The main finding is that the only necessary incentive would be the subsidies to lower purchasing costs by 50%. Other operational costs are lower than with a diesel truck and operation is identical with that of a diesel truck.

7.3. Main findings and scope for replication and scaling up

The activity in Berlin was mainly aimed at a feasibility analysis and the elaboration of a business model for a future initiative and did not include any actual test or demonstration.

The replication of the initiative is therefore yet to be a possible subject of assessment. However, the model implied largely relies on exploiting the availability of space and infrastructure in the former freight station of Tempelhof. The model is simple and envisages transshipment operations centred on one rail track, by means of a reach stacker, and last mile distribution with an electric vehicle.

Such scheme has a high degree of replicability as long as the basic infrastructure requirement (rail terminal) is met. The involvement of public administration (either direct or indirect) for the provision of assets is also envisaged, which adds to the replicability of the model.

As for scaling up, it is not possible to provide assessments at this stage of the initiative.

One of the peculiarities of the Berlin application, which could be tested in other location, is the networking and stakeholder consultation methodology that was adopted. Instead of organising big and crowded meetings, only two to three-person conversations were organised, as this was considered the most effective method to get real information and honest opinions.

As mentioned in Deliverable 2.2, this approach is especially helpful in contexts where the size and role of the city (i.e. big cities or administrative centres/capitals) imply the existence of a number of groups/platforms/networks already in place which crowd up the picture and would make the operation of a further committee particularly marginal and ineffective.

A similar approach, adopted in Padua even if for different reasons (because of the advanced operational conditions and progress of the project) proved successful as well in making meetings with interested stakeholders more effective.

8. FORLÌ | ITALY

8.1. Description of the initiative

The Municipality of Forlì participation in SMARTSET project is in line with the Municipality's long-term commitment to Sustainable Energy Use and CO₂ reduction and it is a key element of its strategy on sustainable mobility and logistics.

Within the project the Municipality of Forlì is willing to develop a sustainable and shared business plan to improve freight delivery locally through the work of a local freight committee, the expertise of Forlì Mobilità Integrata, the dedicated in-house company, and the lessons learnt from the experience of previous and existing schemes. Since the city freight delivery system is very fragmented and without a single terminal, SMARTSET offers the opportunity to identify and test a new sustainable shared business model.

The project envisages the following activities:

- start up of a Forlì freight committee including representatives of local business, hauliers and the municipal mobility company aiming at sharing local goals;
- identification of needs for improvements;
- definition of a feasibility study of possible solutions including the opportunities offered by local regulations/incentives and the use of innovative means of transport;
- development of a full local business model and a site-specific deployment plan.

8.2. Outcomes of key activities

1. Setting up a new service for urban delivery (including the realisation of a Feasibility Study) In March 2014 the results of the survey on freight transport logistics in the urban area of Forlì were presented to the Local Forum. The project focuses on retail shops located within the historical centre of Forlì, an area where local traffic is restricted or closed. In this area 411 shops (including bars, restaurants, etc.) operate, of which 216 were interviewed, representing 53% of the total. In order: clothing stores, bars / pubs / bakeries, footwear and food are the most represented. Five carriers supply 85% of the stores and about a third of them is supplied, exclusively or partly, on their own. The average number of parcel per delivery is 6 and their average weight is less than 10 Kg.

After the survey on freight transport logistics of March 2014, and the meetings of the Forum of stakeholders in March, April and July 2014, the feasibility study for a Urban Logistic Centre for the last mile has been carried out in January 2015. The study highlighted that a dedicate Urban Freight Terminal for the city Centre of Forlì could be feasible if three conditions are given: 1) municipal access regulation to the historical centre, particularly in the Pedestrian Zones (PZ) and

in the Limited Traffic Zone (LTZ), which rewards eco-friendly vehicles of the UFT; 2) the creation of a specific company to manage the logistics of the last mile with the direct participation of the most important stakeholders (Chamber of Commerce, Business associations, Couriers, etc.); 3) a strong support, also economical, by the Municipality of Forlì. Finally, the study envisages that the ordinary management of the service would be given to a newco or to an existing logistics operator.

2. Raising awareness of operators In March 2014 a Steering Committee (Local Forum) for the city logistics of goods was established, with a kick-off meeting in conjunction with the first local network meeting.

3. Foster networking of operators In order to obtain wider adhesion to the survey, it was preceded by the distribution of a leaflet to all shops, signed by the Councillor for Trade of the City, which informed about the purpose of the Smartset project.

8.3. Main findings and scope for replication and scaling up

The aim of this site was not to run a test or demonstration but to prepare the ground for a future initiative mainly through the realization of a feasibility study.

The characteristics of the city of Forlì and of its logistics situation, including the fact that no freight committee ever existed and the logistics has never been considered as a problem by the public authorities, generated the choice for a **soft approach of the Municipal administration to the new policies**.

In such a case, contrary to what happened in Padua or in Berlin, large and participated information and discussion meetings are needed in order to increase the stakeholder involvement as much as possible and lead the focus of the Municipal administration towards the initiative.

The possibility of replication or scaling up is not relevant until the political support to implement the initiative in the first place will be achieved.

However, the business model designed in the Feasibility Study envisages a number of elements capable to give strength to the implementation of an actual city logistics initiative, such as a regulation for limiting the access of private vehicles to the city centre and above all the **creation of a newco** for managing the service via the design of a public tender for the concession. This element can set the base for an effective mix of public and private resources which given the size and characteristics of the city can prove to be appropriate, and replicable in other similar contexts.

9. GRAZ | AUSTRIA

9.1. Description of the initiative

With 265.000 inhabitants, Graz is the second largest city in Austria. It is the capital and the cultural, economic and university centre of the province of Styria. Graz is a world heritage city with a compact city centre with narrow streets. The strategy of the policy is to improve the “alternative mobility” public transports, cycles and pedestrians. Therefore, an important goal is to reduce transport services in the centre – especially by big trucks – to a minimum. Small and clean cars should distribute all goods in this central area, picking up all deliveries at a central hub. A “last-mile-solution” to improve this logistic problem was considered as interesting for Graz.

The project envisages the following activities:

- In order to reduce the freight deliverables by big trucks in the City, it is necessary to install a retail model to deliver the goods from the city centre to the different aims in the city centre by small, clean vehicles. Therefore the activities will include the analysis of the present forms of deliveries, the development of a new delivery model and the involvement of the different shopkeepers and other stakeholders located in the centre aiming at informing them about the pros of the new system;
- Launch and extend the BringMe pilot, to deliver shopping from the inner city shops to the homes of consumers. Within the framework of the Graz’s aim concerning last-mile deliveries to the city centre, the BringMe initiative aims to build confidence, among shops, in the effectiveness and reliability of a publicly-promoted, coordinated and optimized service for the delivery of goods, in order to lay the ground for the future implementation of an actual last-mile delivery service to shops.
- In order to define possible solutions including the opportunities offered by local regulations/incentives and the use of innovative means of transport, the European Programmes and International Cooperation Unit and the Environmental Department cooperates within SMARTSET.

9.2. Outcomes of key activities

- 1. Feasibility study** The Feasibility study of the Bring mE project was positive and on its basis the decision to continue the project was taken by the involved stakeholders.
- Due to the small amount of deliveries, Bring mE was not able to cover the costs thus far. Therefore, a recalculation of the delivery price needed to be done, as well as new marketing strategies needed to be developed. The evaluation showed that the acceptance of the service was high and, nevertheless, it needed to be expanded in order to reach more customers and include more shops.

- 2. Special delivery service** “Bring mE” was launched in August 2014 with the goal to prove the efficiency of the business model for all the stakeholders, including customers and shop owners. 24 shops in and around the inner city of Graz participated in the pilot project.
- 3. Follow up plan / exploitation plan** A number of marketing solutions have been identified: the booking process should be simplified; the delivery price should be unique, regardless the parcel size or the delivery distance; the biggest shopping mall in the city centre, “Kastner & Öhler”, is invited to join the service, thus improving the image of “Bring mE” in the eyes of other stores and customers; the creation of an online platform, so that the delivery can be carried out on the same day; benchmarking with similar delivery services in Vienna, in order to compare the performance. In the future, the delivery is planned to be extended to the other parts of the city. At the same time, thanks to the planned marketing actions, it is expected to get more customers. As a result, the business will have more deliveries at a time, which will increase its profitability.

9.3. Main findings and scope for replication and scaling up

Like in Berlin and Padua, in Graz the main aim of the activities within the SMARTSET project were the realization of a feasibility study for a city logistics service and not the actual performance of a demonstration.

The stakeholder consultations were organised involving all the relevant actors influencing the business and were conceived as an instrument to involve stakeholders and to raise the awareness on the problems and on the solutions included in the proposed project. Moreover, and above all, they were conceived as a place to take decisions that could make the difference in term of operation and that could have an impact on the service, in order to guarantee - or at least in order to try to meet - the economical sustainability of the project.

One of the most important lessons to be learnt from the Graz BringMe initiative, to be translated into an action item also for the implementation of the future last-mile delivery service, is the continuous monitoring of the project and of its sustainability. In particular, it is peculiar how the approval of operations is subject to continuous check in which all the project is revised and the decision whether to continue or not is taken. Once the technical and operational feasibility is proven and once the high degree of acceptance of the project is registered, the continuous monitoring is crucial in order to check if the planned path is followed and, otherwise, to implement corrective actions.

The context of Graz is favourable for city logistics initiatives in that its centre has an extensive pedestrian zone, with parking and delivering areas restricted by regulations and time windows.

The BringMe project is itself a means to scale up a former delivery service that had proven that optimized delivery to and from the inner city is possible, with deriving reduction of noise and emissions.

The most important step for optimizing city deliveries is to extend the shop's participation – which is currently collected on a voluntary basis. BringMe can therefore help creating confidence among shop-owners in the possibility to coordinate the last mile delivery and bringing benefits to their businesses. The B2C service “bring mE” does not need a logistic hub by itself, nevertheless the cooperation of all stakeholders (City of Graz, shop owners, transport companies) could create a basis in order to plan and further implement a logistic hub in the inner City of Graz.

10. ROME | ITALY

10.1. Description of the initiative

The City of Rome participates in SMARTSET aiming at implementing a small freight terminal to serve the Old Town and in particular the area is expected to be made a pedestrian (the so called “Tridente” zone). Although traffic congestion of private vehicles was reduced by some 20% within the Limited Traffic Zone of the Old Town (LTZ), there are still around 5,500 freight vehicles entering the area every day (15% of the total entrances) in the central LTZ and each vehicle enters the area at an average frequency of 16 days per month.

The project envisages the following activities:

- establishment of a freight management board;
- negotiation talks with stakeholders;
- context analysis;
- identification of the optimal location for the last mile freight Terminal;
- implementation of the last mile freight Terminal;
- set and monitor levels of performance;
- use the results to help the development of a sustainable business model;
- outline a common approach to regulations and incentives aimed to achieve the maximum effect.

10.2. Outcomes of key activities

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|---|---|
| 1. Establishment of a freight management board | The freight management board includes Environmental Ministry; Rome Municipality; Rome Mobility Agency (RSM); Unindustria - Union of industrialists and businesses in Lazio region; University “Sapienza” Rome. It had it’s kick-off in 2013 and a working table on the feasibility check to implement Urban Freight Terminal (UFT) started up, aiming at defining common analysis of the innovative solutions in the city centre. The table goals are to propose solutions in urban logistic, with specific interest in the historical centre and to encourage progressive pedestrianisation. |
| 2. Negotiation talks | With the negotiation activities concerning the service implementation, service parameters for the business model were identified: the assumptions for the sizing area used as transit points; the forecasted income statement on the management of the same; the business model will have to identify and overcome the economic constraints to the establishment of a transit-point, whose cost have to be as low as possible. |
| 3. Analysis of context | The study on the area was performed on the basis of previous studies on the commercial activities, tertiary sector and resident people into historical centre. The first survey concerns the LTZ freight study composed by 16 districts (called |

- “rioni”), lived by 50,000 inhabitants and 129,000 employees. The second survey focused the attention on commercial activity per product category.
- 4. Identification of the optimal location** The City Administration took the facilitator role checking the availability of public spaces owned by City Administration in central areas to be used as Urban freight Terminals (UFTs) to re-arrange goods and reduce impacts. The chosen areas will be mostly in the north part of the city, because they are in a good position for the activity of goods delivery to the Historic Centre.
- 5. Rationalisation of goods distribution** At this phase, the freight committee is analysing the **business model keys elements**, as identified: key partners, structure costs, key activities, customer relationship and so on, according to the Business Model Canvas. Italian case studies of UFT already operating, have been analysed in order to have a complete framework of next business model.
- X. Regulations and incentives** A number of regulations (for access and parking, for incentives) were assessed.
- 6. Setting and monitoring levels of performance** The freight committee identified the KPI related to manage the UFT, not only based on economic aspects, but also in terms of vehicle-km decreases and emissions reduction (according to similar UFT pilot experiences).

10.3. Main findings and scope for replication and scaling up

The City Administration and the Mobility Agency played a major role as facilitators. Such role was channelled through three types of activities:

- 1) Set up a committee for achieving agreements among stakeholders
- 2) Analyse the possible location of the UFT
- 3) Assess possible new regulations for improving inner city mobility

The latter two activities seem to be particularly fundamental for the possibility to scale up and replicate the experiences.

In reference to implementing new regulations and/or incentives, peculiarities and particularities are to be taken into account as the contexts are inherently unique, but common needs and in some cases of similar solutions emerge.

The City Administration and the Mobility Agency acted as facilitator and building on the experience of an existing consolidation centre managed by a private logistics operator which already runs a market-driven city logistics experience, checked the availability of already existing but still unused public spaces owned by City Administration in central areas to be used as a new Urban freight Terminals (UFT).

In fact, in most of the cities the public authorities own public spaces and areas that are unused and that could be simply revamped and used for free (or for favourable fees) for new and more productive aims such a city logistics initiatives.

11. SUNDSVALL | SWEDEN

11.1. Description of the initiative

The city of Sundsvall is located at the Botnian Gulf, about 350 km north of the Swedish Capital of Stockholm. Sundsvall has a population of 96,000 inhabitants and the population within an hour's travelling distance is 200,000. The bulk of non-durables and consumer goods are presently transported by trucks from the south of Sweden to the area of Sundsvall. Transfer from full sized trucks to smaller distribution vehicles for final deliveries to the shopping centre Birsta in Sundsvall is done through several small terminals.

Only a small part of the transshipment is handled at the existing state-owned intermodal freight terminal in the vicinity.

Sundsvall has adopted a strategy with the aim of becoming a logistics centre for goods destined to the Sundsvall area and the mid-Nordic region. The plan foresees efficient infrastructure developments connected with business platforms offering a wide range of services for the goods owners with an aim to be as environmentally sound as possible through the whole supply chain. Replacing truck services with intermodal solutions based on rail and distribution trucks powered by renewable fuels i.e. locally produced biogas for the last mile are to be used to achieve these targets.

The project envisages the following activities:

- Development of a business case for a green intermodal transport solution of consumer products from southern Sweden to Sundsvall and its surroundings including last mile distribution;
- review and suggest changes to rules and regulations necessary for implementing the business case;
- implementation of the business case in a new intermodal transport solution;
- together with a haulier develop a business case for a last mile loco which is tested;
- support the food retailer COOP in testing a over sized truck – mega truck – for its transports to Sundsvall;
- dissemination of good practices in local and national networks.

11.2. Outcomes of key activities

- 1. Introduction** The strategy includes four individual concepts that, when taken together, would reduce the energy consumption of freight transports. The concepts are: intermodal transport of any type of goods to Sundsvall; investigation of business cases for a last mile loco including a trial in a real transport; greener city logistics to the Sundsvall city centre; trial with COOP products of a road train from Stockholm to Northern Sweden.

2. City deliveries

Workshops and networking have started with the key stakeholders such as operators, shop keepers and property owners. The analysis of solution for using sustainable vehicles highlighted that the use of electricity could be a problem during wintertime in Sundsvall, while there could be the possibility to use biogas or HVO 100 as fuels for vehicles in the city centre. During the course of the project it became clear that Sundsvall within the project did not have the possibility to change regulations and develop incentives with the aim to encourage green city logistics concepts. Sundsvall does not have the congestion problems of big cities like Rome; The problem for Sundsvall is the air quality, but at the same time penalising conventional distribution vehicles would risk driving away businesses from the city centre which is not desirable from a living inner city perspective. This is a major reason why it is very difficult to implement regulatory changes that favours green city logistics business cases in Sundsvall. (shop keepers leaving the city centre is already a problem).

2. Long-run intermodal transport solution

Stakeholders that have been contacted are Van Dieren, COOP logistics, Sandalsbolagen (DB Schenker affiliate), the rail operator Rush Rail, the terminal operator Logent, the chemical industry Akzo Nobel, the pulp, paper and sawn goods producer SCA.

Business concepts were discussed with Rush Rail, Van Dieren and others. What stands out is an aversion to accept business risks i.e. try out an intermodal transport without having secured enough payload for a profitable operation. Varying customer demands on frequencies, lead times, costs and reliability must be reconciled and return transports secured in order to avoid empty running of trains.

Sundsvall's logistics park employed a consultant from Sweco for the task of putting together a business plan for an intermodal transport serving the terminal in Sundsvall. The result is an intermodal transport that is now running from Trelleborg with stops in Katrineholm, Sundsvall and Umeå. The transport is marketed under the name South-North train.

3. HCT

Sundsvall and Trafikverket also worked with the food retailer COOP and their haulier Post Nord in trying to set up a trial with a so called mega truck for its transports to Sundsvall and beyond. An application was submitted in January 2015 where routes, traffic safety concerns, technical stops for driver pauses and terminal sites were thoroughly described. The trial is pending a government decision for an exemption from the existing regulation on truck lengths. It is outside the project group's power to influence the speed of the decision making

process.

4. Last mile loco

Trafikverket employed a consultant again from SWECO for contacting loco suppliers and hauliers that would result in testing a last mile loco. Trafikverket also hired, with own funding, the research institute TFK to help with the task. Several suppliers were contacted but no one could lend a loco within the time period of SMARTSET. The work with looking into how last mile locos can make rail transport a more attractive proposition will continue in for example the recently started innovation programme Shift2Rail.

5. Networking

Sundsvall will share the management of the established city logistics network with the local chamber of commerce. This will ensure that discussions on viable green city delivery business cases and their implementations will continue after SMARTSET ends. Sundsvall Logistikpark has become a member of the national logistics cluster Closer. The cluster is based in Gothenburg and gathers academia, shippers, technology providers, terminal operators and public bodies around research and innovation for improved logistics. Through Closer the Logistics Park and Trafikverket get a good overview of projects of relevance to Smartset. Trafikverket is part of an approved that among other subjects looks into this issue sent in under an ERA-NET call. Sundsvall Logistikpark has during the Smartset project also become a member of TFK which is a research organisation that is member driven. City of Sundsvall has also been able to join the National network of city logistics for municipalities in an organisation that is called SKL (The municipalities union in Sweden).

11.3. Main findings and scope for replication and scaling up

The Sundsvall experience is strongly associated with its geographical position and the aim to transfer the transport of goods from road to rail, its focus having naturally shifted from the city deliveries to the preparation of a long run intermodal solution for inbound freight.

Though Sundsvall's initiative greatly suffered from the sudden termination of the original strategy, due to the envisaged logistics partners stepping out of the project, the promoters showed resilience in fostering their willingness to make advancements in the optimization of freight deliveries.

The networking activities that followed were intense and underline the importance of such element of the action plan for every city that aims at providing city logistic services.

The best practice analysis was not only a study but was complemented with a pair of on-site visits in in Gothenburg aiming at the study of the Stadsleveransen setup and operations.

Further indications may derive from advances in the pilot phase in the months following the period in which this report has been written. Both Sundsvall and Trafikverket are members of the logistics research cluster CLOSER. Sundsvall and Trafikverket will continue to work with new greener logistics

concepts within CLOSER. Future projects will build on the lessons and experiences that have been acquired in SMARTSET.

12. CONCLUSIONS

The activities carried out in the application sites in the SMARTSET project framework were aimed at multiple types of objectives. In leader sites, partners were in a position to pursue the implementation of actual demonstrations of city logistics services, whereas among the followers some activities were focused on the elaboration of a feasibility study including development of business models (Berlin, Forlì and Graz), and others included the operation of a freight terminal within the broader scope of a long range modal shift initiative (Sundsvall) or of a set of regulations for managing traffic in the inner city (Rome), so that the actual test will be performed in later stages of the project.

While this variety of focuses does not allow to draw “horizontal” conclusions as to the outcomes of such initiatives, offering a comprehensive point of view on the market driven business model approach which SMARTSET means to focus on, it enables to take a look at specific elements of it and derive findings, albeit partial, as to the scope of a number of lessons learnt.

Such findings regard the following aspects, which are hereby presented in a logical order of importance, looking at an ideal timescale for the planning and deployment of a UFT-based city logistics initiative:

- 1) Preliminary analyses** – All the experiences highlight the relevance of preliminary market analysis in order for city logistics initiatives to be successful. Market analysis prove particularly helpful when aimed not only at quantifying or estimating the potential demand of the service, but also, where appropriate, to define the different types of user needs and requirements in order to better design the service itself, as well as to identify the categories of users whose involvement in the service is most promising. As it turns out from the analysis of SMARTSET initiatives, while on one hand the more detailed and informed such analyses are, the more helpful they are in the startup phase of the service, on the other hand the planning and continued implementation of the service cannot rely on a single preliminary analysis, but have proven to take advantage of careful step-by-step strategy, which includes continued involvement of stakeholders, continued analysis of market opportunities and a gradual expansion of the service (addressing new customer segments or increasing capacity).
- 2) Clear definition of objectives** – The preliminary analyses, run with different methodologies and approaches, must lead to the definition of a set of clear issues to be tackled and priorities related to urban freight delivery policies, defined in accordance with the stakeholders. In fact, each urban environment has its specific criticalities related to a range of factors such as urban shape and planning, infrastructure, commercial and business structure, citizens’ needs and social acceptance, etc. which determine a set of priorities, either pollution, congestion, efficiency of last mile delivery services etc.
In any case, the need for city logistics policies remains high due to inefficiencies in allocating resources and high impact of external costs, therefore common and targeted policy measures must be identified and concrete activities must be implemented.

3) Involvement of stakeholders – Consultation, discussion and engagement have been fundamental in all experiences in SMARTSET. In contexts where this has been critical, the difficulties in the involvement of stakeholders have proven able to put a significant burden on the smoothness of the whole process of implementation; on the contrary, in other contexts where the support of stakeholders – both public and private – has been obtained, initiatives have run seamlessly. The approaches to involve stakeholders can be varied and the SMARTSET experiences have shown that the size and nature of the concerned city greatly affect the optimal design of a freight committee aimed at involving stakeholders and keeping their interest and commitment high: in bigger cities, where groups/committees usually abound, it is more effective to add a city logistics plan as a topic stream into one of the pre-existing networks; in smaller cities, the city logistics agenda might be the occasion to establish a dedicated freight committee.

4) Assets and regulations – Connected to the former point, an assertive remark can be derived from the analysis of SMARTSET experiences as concerns the viability of market-driven business models in city logistics. In fact, while the definition of a “market-driven” initiative usually entails its independence from public subsidies via monetary funding (e.g. covering losses or directly taking charge of shares of operating costs) and therefore the possibility to break-even relying on proper revenues streams, the presence of some type of public support can hardly be excluded. Such types of support can come in different forms, mainly of two types:

- the provision of one or more of the necessary assets for the implementation of the service (area, facilities, equipment), either for free or under the payment of pre-determined, non-market fees within the framework of a concession awarded via tender.
- the provision of regulations, mostly concerning the authorization to move within certain areas (LTZs, priority lanes, time windows), that are based on the public advantages deriving from the city logistics scheme and increase their attractiveness for users.

While the former type of support has a direct impact on the balance sheet of the city logistics provider and can therefore be considered as a type of subsidy, the latter is a “soft” element which facilitates the operations of the city logistics provider, enlarging its market or setting the ground for a more efficient and/or profitable management.

5) Customer segments and revenue streams – In order for a market-driven service to be successful, an appropriate and preliminary definition of what the “market” of the service is a fundamental condition. The most typical instance includes forwarders and transport operators as customers, that pay the city logistic provider for it to supply the last mile service to the city centre. Additional revenues can be present (e.g. advertisement). However, one of the initiative analysed in SMARTSET suggests a possible scaling up of the service via a different type of customer segmentation, aimed at involving larger subjects (institutions such as hospitals, universities etc) who are charged for using the goods consolidation and distribution service in lieu of a multitude of users which operate within their premises/area

How these elements fit in the overall design of an effective market-driven business model will be the subject of a future SMARTSET Deliverable (2.7); similarly, further remarks on the possibility to deploy or scale up will be investigate in a following SMARTSET Deliverable (2.4).