FINAL REPORT

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EXECUTIVE SUMMARY

The Dorothy project was targeted to develop the potential of innovation and research in the field of Urban Logistics, in four European Regions composing the project Consortium. The four partner Regions are: Toscana (Italy), Comunidad Valenciana (Spain), Regiao de Lisboa e da Valle do Tejo (Portugal) and Oltenia (Romania).
Even if Urban Logistics is a component of mobility often neglected by cities, it represents a very important and crucial issue from several points of view. Transport is a major economic sector in the European Union, directly employing around 10 million people and representing about 5% of its GDP, with Road Transport contributing for about half of these values. About 44% of goods transported in the EU go by road and in this context, Urban Logistics is the weakest link of the chain, i.e., it operates in a very complex and congested scenario with increasing demand and costs.
At the same time, due its importance, Urban Logistics can represent not only a problem, but also and especially an occasion for innovation and economic development.
The aim of Project Dorothy was to create a strong and efficient link between the potential performable improvements of Urban Logistics in the partner Regions and the subsequent economic development of the local economic tissue of the latter, making leverage on innovation as the key factor for enlarging and bettering the market.
The above described strategy has been pursued during the project life span, among the others, through the creation of local Clusters, gathering a set of important players operating on Urban Logistics from different perspectives, according to the triple helix philosophy: logistics operators, industrial companies providing technological products for this market, Universities and research institutes. A very important role in respect to Urban Logistics is played by local Administrations, so that they have been involved in this process too.
Moreover, the Clusters have been created in line with the regional S3 (Smart Specialization Strategies), covering the sectors and development lines pointed out as strategic by these regional strategies. In doing so the Clusters' development could/should /will find in the next future an appropriate regional support in different forms, i.e., policy making, funds et al.
Altogether the partners of the Dorothy Clusters developed a specific Joint Action Plan (JAP), which it contains a comprehensive set of strategies for the growth of the Clusters themselves, through actions for the development/implementation of new products, research initiatives, education initiatives and enhancement of the cooperation between Public Administrations, especially with cities and economic operators of the Urban Logistics sector.
The JAP provides a set of integrated actions, planned and described in detail, along with the identification of the stakeholders, their relationships with the regional policies, a financial plan for the implementation of the actions themselves and an evaluation of their impact from different perspectives (economic, environmental, social and urban).
The JAP has been disseminated in the partner Regions by involving a large number of different stakeholders and also at national and international level.
During the last part of the project the first steps of the actions implementation foreseen by the JAP have been monitored in such a way to ensure the start-up of the operational activities of the Clusters. Moreover, operational initiatives for the internationalisation of the companies (mainly SMEs) belonging to the Clusters have been carried out.

1. PROJECT CONTEXT AND OBJECTIVES

a. General framework and context

Urban Logistics as a part of urban mobility
Cities constitutes the backbone of Europe's civilization and gather the large majority of population. Although connected by one of the world's best transport systems, mobility within European cities is increasingly difficult and inefficient. In many urban areas, increasing demand for urban mobility has created a situation that is not sustainable: severe congestion, poor air quality, noise emissions and high levels of CO_2 emissions. Many European towns and cities suffer from chronic traffic congestion, which is estimated to cost 80 billion Euros annually and the EU evaluates that the current costs for traffic congestion in urban areas will increase by 50% up to 2050.

Urban mobility is still heavily reliant on the use of conventionally fuelled private cars, in such a sense only slow progress is being made in shifting towards more sustainable modes of urban mobility. Therefore, urban transport is responsible for about a quarter of CO_2 emissions from transport sector, of which freight distribution accounts for about a quarter (urban freight is approximately 6% of all transport GHG emissions). Overall, despite the efforts of some cities and Member States, reducing these emissions will require major efforts in the years ahead.

Urban areas also account for 38% of Europe's road fatalities, with vulnerable users such as pedestrians being particularly exposed (about 28.000 road fatalities in 2012). Progress in reducing road fatalities has been below average in urban areas, where 69% of road accidents occur.
Cities need to make more efforts to turn past trends around and contribute to achieving the 60% reduction in greenhouse gas emissions called for by the Commission's White Paper.

Having the aforementioned aspects in mind, distribution of goods in urban areas has a specific and relevant role in urban mobility and a severe impact on traffic congestion and growing externalities costs. Urban logistics ensure that shops and businesses are stocked, equipment is repaired, home deliveries are performed, buildings are supplied and waste is removed. Every place of activity requires deliveries and servicing - if these logistic demands are not properly planned, urban logistics can be inefficient producing higher fuel consumption, pollution, and congestion (the so-called externalities). The demand for goods distribution in cities is expected to grow, driven by fundamental changes in consumer's behaviour. This will possibly further increase the external costs and environmental impacts if business will go on as foreseen. As a consequence, improving the efficiency of the 'first and last mile' of deliveries is particularly important for economic growth, livelihood and sustainability of public spaces within the city. The framework for urban logistics is given by a multiplicity of factors, i.e., local and regional economy, the transport infrastructures, the surrounding environment, the legal and regulatory conditions.
This means that cities must be able of identifying and implementing an appropriate mix of measures and policies to facilitate the movement of goods in cities. Moreover, the regulations for transportation of goods in cities should become a fundamental part of the more general concept of urban mobility as a factor of competitiveness of cities.

In a communication to the European Parliament the Commission clearly stressed the importance given by the European Union to Urban Logistics and how this topic is significant in our economy [1]:
"Cities are places for the exchange of goods and information which are at the heart of our economy and way of life. For cities to be successful they need to optimise the exchange of goods and information while remaining attractive places to live and work.
Urban logistics ensure that shops and businesses are stocked, equipment is repaired, home deliveries are made, buildings are supplied and waste is removed. Every place of activity requires

[1] Together towards competitive and resource-efficient urban mobility {COM(2013) 913 final}

deliveries and servicing - if these logistic demands are not properly planned for urban logistics can be inefficient (e.g. low load factors) and polluting.
Urban logistics makes up a relatively small share of urban traffic but makes a major contribution to the success of cities. Improving the efficiency of the 'first and last mile' of deliveries is of particular important for economic growth.
Europe's cities continue to grow: 73% of Europeans already live in cities and cities generate 85% of European GDP and the level of urbanization is expected to rise to 82% by 2050. A growing urban population combined with other trends (e.g. home delivery, ageing population, e-commerce etc.) will lead to increased density and increased demand for goods and services with consequently significantly increased demand for urban logistics.
As a consequence, a city without an efficient and effective logistics supply, both in terms of services and infrastructure, can see seriously compromised its economic development and its competitiveness.
Congestion has a negative impact on the competitiveness and environment of urban economies; it causes inefficiencies in logistics operations and increases costs. The costs of the 'first' and 'last mile' of supply chains are too high and represent a barrier to growth of home delivery.
The environmental impacts of urban logistics operations can be high contributing to air and noise pollution, road damage and greenhouse gas emissions. Urban freight vehicles contribute disproportionally to air and noise pollution. Due to the proximity and density of people in urban areas the external costs of urban freight transport can be high. On the positive side, efficient and functioning urban logistics operations improve the delivery experience for consumers buying on-line, they can lower delivery costs, and contribute to a sustainable development of delivery solutions.
Urban transport emits approximately 23% of transport CO2 of which about a quarter is urban freight (urban freight is approximately 6% of all transport GHG emissions). Despite the efforts of some cities and Member States, reducing these emissions will require major efforts in the years ahead.
The short distances, regular start stop, captive fleets and the large number of people exposed to the air and noise pollution provide an opportunity for urban logistics to make an early and significant contribution to optimising transport and foster the early and cost effective introduction of new types of operations, technologies and business models.
Moreover, European cities, unlike the so-called pop-up town born from nothing, for example in China, have historical configurations that cannot satisfy an increase in the transport flow to urban centres. Freight transport in urban areas presents requirements and difficulty elements deeply linked to the context in which it operates. On the other hand, the presence of constraints can also be seen as an opportunity, because it can stimulate design of more intelligent and efficient innovative systems."

Notwithstanding this importance, few cities have a well-developed and comprehensive urban logistics strategy. City authorities focus their attention and resources on passenger transport and neglect the contribution urban logistics gives to the city economy and the potential positive impact that an improvement of urban logistics efficiency and a reduction of costs could have on cities themselves. Despite its key role in the urban economy, few cities have a clearly identified official responsible for urban logistics. Public passenger transport is usually supervised by the competent administrative body, while freight transport distribution is normally a task for the private sector. Businesses, operators, infrastructure and service providers, in their planning activities, need to make reference to a well-considered and stable long term vision for city logistics. Some cities may decide to focus on reducing costs others on air quality improvements, safety or reducing greenhouse gas emissions, but to be effective, the vision needs to be integrated with other urban policies, clearly articulated and shared by all stakeholders; and in the majority of cases, Urban Logistics is not properly integrated into urban transport, economic and territorial development strategies. Therefore, local authorities must consider all urban mobility related to passenger and freight transport together as a single logistics system and create a strong link between urban planning and the transport system. This kind of process needs a wide consensus among all the

players, and in the specific case by the private players operating on urban logistics, in order to address coherently the inefficiencies in the whole chain and develop common solutions.

The EU perspective and action on Urban Logistics

The European Union has been tackling the challenge of an increasing demand for passenger and freight transport in urban areas with the objective of better meet the diverse needs of citizens, businesses and industry. According to the EU Green paper "Towards a new culture for urban mobility" (COM(2007) 551 final), any urban mobility policy must cover both passenger and freight transport, hence, the need for more sustainable and integrative planning processes – also in sectors related to urban mobility – has been already widely recognized.

The EU Action Plan on Urban Mobility reports the intentions of the Commission to provide help on how to optimize urban logistics efficiency, including how improving the links between long-distance, inter-urban and urban freight transport, aiming to ensure efficient 'last mile' delivery. The plan focuses on how to better incorporate freight transport in local policies and plans and how to better manage and monitor transport flows. In the Freight Transport Logistics Action Plan, "*an holistic vision should cover freight transport and pay attention to aspects of land use planning, environmental considerations and traffic management, alongside a number of other factors. Facilitating freight and "passenger transport demand management should be an integral part of town planning and offers opportunities for the deployment of innovative ICT-based solutions"*. Sustainable urban mobility planning is focused on the level of the urban agglomeration; nevertheless, it is embedded in a wider regional and national framework for planning activities in the field of urban mobility. This includes for example regulations, funding streams or higher-level strategies for spatial and transport development (e.g. a national transport plan, where one exists). It is crucial to assess the impact of the regional/ national framework to fully exploit opportunities and avoid conflicts with higher-level authorities at a later point.

The 2011 Transport White Paper announced the Commission's intention to produce "best practice guidelines to better monitor and manage urban freight flows" and to put forward "a strategy for moving towards 'zero-emission urban logistics." The EC White Paper established ten goals for a competitive and resource efficient transport system, with the objective of achieving the 60% GHG emission reduction target by 2050, with respect to 1990 levels. Among these objectives, the following is to achieve : "[…] essentially CO2-free city logistics in major urban centres by 2030".

Sustainable Urban Mobility Plans (SUMPs) have gained increased recognition and importance at EU level within the presented framework, and their adoption has been highly incentivized by the European Commission. The Urban Mobility Package aims at accelerating the take-up of SUMPs in Europe by providing guidance material, promoting best practice exchange, identifying benchmarks, and supporting educational activities for urban mobility professionals. Sustainable urban mobility planning received a further significant push when the EU transport ministers adopted conclusions on the Action Plan on Urban Mobility in Luxembourg on 24 June 2010. The Council of the European Union "supports the development of Sustainable Urban Mobility Plans for cities and metropolitan areas [...] and encourages the development of incentives, such as expert assistance and information exchange, for the creation of such plans".

The SUMP concept considers the functional urban area and proposes that action on urban mobility is embedded into a wider urban and territorial strategy. Therefore, these Plans should be developed in cooperation across different policy areas and sectors (transport, land-use and spatial planning, environment, economic development, social policy, health, road safety, etc.); across different levels of government and administration; as well as with authorities in neighbouring areas – both urban and rural. SUMPs are about fostering a balanced development and a better integration of the different urban mobility modes. This planning concept highlights that urban mobility is primarily about people and it therefore emphasizes citizen and stakeholder engagement, as well as fostering changes in mobility behaviour. Therefore, a SUMP "should present measures to improve the efficiency of urban logistics, including urban freight delivery, while reducing related

externalities like emissions of GHG, pollutants and noise", as presented in the Commission's Urban Mobility Package. Member States and urban authorities need to provide a framework (e.g. delivery spaces, access regulations, enforcement etc.), to ensure that there is a business case for the private logistics operators to invest in new technologies and solutions. They should also facilitate cooperation among players, build the necessary capacity at the local level, stimulate the take up of good practice, ensure interoperability of local logistics solutions based on Intelligent Transport Systems and ensure integration with national priorities. As part of the SUMP it is possible to integrate specific issues related to Urban Logistics developing a SULP – Sustainable Urban Logistics Plan that is a step to the integration between passenger and freight transport and other urban policies envisaged in EU Green Paper "Towards a new culture for urban mobility". SULPs should set the scene for urban logistics policies by analysing freight distribution processes, defining and choosing among the possible measures and services in collaboration with other relevant players and stakeholders, tailoring the approach and methods to specific local needs and peculiar characteristics. Making urban centres as accessible as possible requires making choices about the use of urban space, in fact, loading and unloading spaces, bus lanes, cars, parking, pedestrian facilities, cycle lanes and parking all compete for urban road space and cities have to manage these competing demands according to local priorities and circumstances. Urban vehicle access regulations can help optimize urban access, improve air quality and contribute to the White Paper goal of phasing out conventionally fuelled cars in cities by 2050.

The Dorothy Project and the missing link: Clusters and Urban Logistics
The Dorothy Project is/was fully compliant with the target of the European Commission in addressing the topic of Urban Logistics with a twofold vision:

- For improving the process of optimising Urban Logistics in the Project partner regions
- For making the development of Urban Logistics an important mean of economic improvement for the productive structure of the regions themselves.

The key factors for achieving this results were Clusters and Innovation.

Clusters are thematic associations of economic activities in a set of industries and specialised enterprises – often SMEs – and other related supporting actors that cooperate closely together, related through different types of linkages and spill overs. Clusters provide several benefits: having a high concentration of companies with common interests, it is possible to easily launch initiatives and projects with common objectives, as well as achieve synergies and better results. The presence in the Clusters of Universities and Research Institutes favours the development and spread of innovation, focused on industrial development.
Finally, the power to influence the decision makers in also integrating the Clusters' strategies in the regional development strategies increases is of paramount importance. Companies belonging to a cluster have a higher likelihood of growing and achieving internationalisation; furthermore, companies that are looking for connections are more likely to connect to a cluster. In working together SMEs can be more innovative, create more jobs and register more international trademarks and patents than they would alone. 38% of European jobs are based in such regional strongholds and SME participation in clusters leads to more innovation and growth.

Clusters in Urban Logistics can be a very effective mean for concentrating skills, experiences and productive specialisations in the territory on an important and growing market, with potential benefit both on the regional logistic chain and on the economic and productive environment,

b. Project objectives

Within the described framework, the DOROTHY project was targeted to develop the potential for innovation and research in four Regions (Tuscany, Italy; Valencia Community, Spain; Lisbon and Tagus Valley, Portugal; and Oltenia, Romania). Moreover, the project was focused on the field of Urban Logistics, which represents a specific application of the innovative initiatives that can be raised through the development and implementation of regional clusters.

By developing and implementing knowledge sharing activities and innovative actions through the regional clusters the DOROTHY project aimed to:

- ✓ Rationalise of the logistics process in cities.
- ✓ Contribute to the emission reduction and the improvement of the quality of the European cities.
- ✓ Foster cooperation in innovation, defining mechanisms to allow that innovation could be implemented in the economic structure of the Regions.
- ✓ Contribute in this way to the economic growth of the Regions.

These general objectives were pursued through some major specific targets:

- ✓ To set up three regional Clusters under the coordination of the already existing Tuscany Cluster (POLIS)
- ✓ To define a Joint Action Plan (JAP) for the four Regions, with the active involvement of the Regional Authorities and Agencies, in a coordinated way to plan the future research and technological innovation activities and to define the reference framework for a potential funding
- ✓ To start the activities defined in the JAP in all the Regions.

2. DESCRIPTION OF THE PROJECT AND OF THE MAIN SCIENTIFIC AND TECHNOLOGICAL RESULTS

a. The Project

The Project partnership reflected the objective of creating brand new regional Clusters and it was built so that each of the regional team was composed by diversified type of partners, i.e., the regional Bodies responsible for the use of Structural Funds, Cities Administrations, Universities and Research Institutes and finally companies. The full list of the partners and the contacts are reported at the end of this document.

Three kinds of companies were represented in the team: engineering companies, ICT companies and logistics operators.

This variety is at the basis of the Cluster concept, where different and complementary bodies have to cooperate with the purpose of creating innovation. So the Dorothy partnership constituted the core of the regional Clusters that progressively gathered additional members.

The partners worked for the whole 36 months duration of the Project in close relationship, almost all the activities were carried out by mixed groups of partners belonging to the four Regions. Such an approach facilitated the identification of possible cooperation areas and strengthened the links among the partners in view of the continuation of the activities after the Project termination.

The Project was articulated into 4 main phases:

1. An analytical part for the detailed and precise definition of the regional scenarios, the diagnosis and the definition of needs and strategies.
2. An operational phase targeted to the constitution of the regional Clusters.

3. The core phase devoted to the definition of the JAP and its promotion.
4. The last part focused on the start-up of JAP actions implementation and the monitoring of the Clusters development.

The Project reached the expected objectives, achieving significant results.

b. Short description of the Project methodology

Given the nature and the objectives of the DOROTHY Project, the methodology followed in developing the work assumed a very important role. It is an indicator of the quality of the analyses carried out for the definition of the context and of the Clusters' strategic development lines and the subsequent definition of the Joint Action Plan (JAP).

The general methodology followed by the DOROTHY Project is schematically reported in Fig. 1

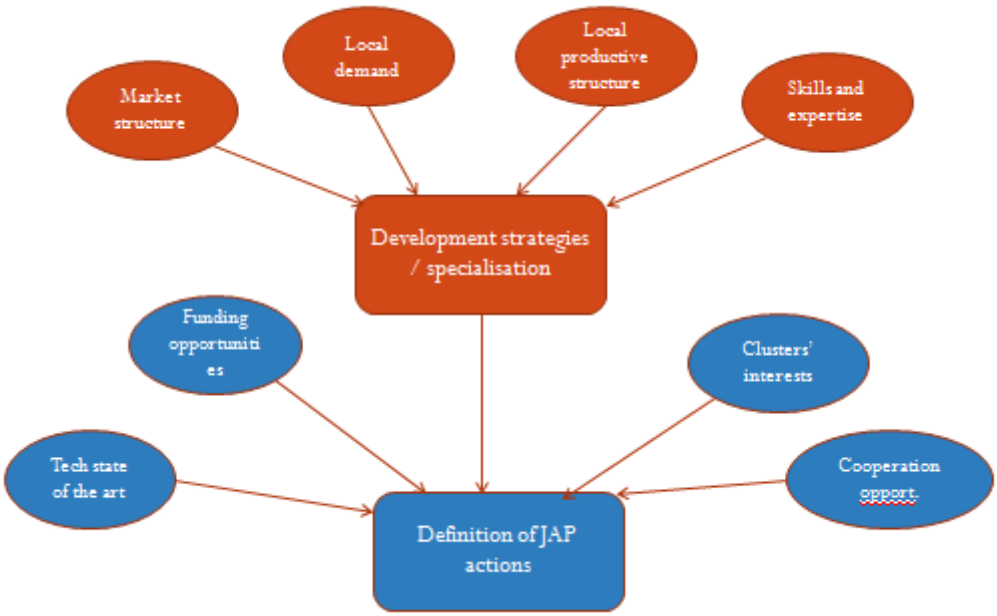


Fig. 1.: The Project Methodology

The first part of the Project was devoted to assess all the aspects of the regional scenarios and the state of the Urban Logistics market, because needed as a starting point for the further steps.

The analyses were focused on the following points:

- the structure of the Urban Logistics market, identifying all the players and the relevant roles.
- the definition of a market segmentation considering a wide set of products/services, the relevant key technologies required and their potential way to the market (mainly the subjects that are interested to acquire these products)
- the R&TI agendas in the partner Regions for having a clear idea of the development of the innovation activities compared with the European state of the art in the field
- the identification of the regional offer and demand for innovation regarding Urban Logistics. In particular focusing on companies and research institutes working directly in the specific field or having specific competences and know-how about key technologies required in the Urban Logistics market. Moreover, the identification of freight distribution operators and municipalities with a special interest in innovating their processes was carried out, providing in doing so the possibility to link the potential offer and demand.
- the analysis of the regional S3 (smart specialization strategies) for identifying the subjects that could constitute the focus of attention for the partners Regions and for having the general scenario for framing the Clusters' development strategy.

The mentioned analyses were also useful to get in touch with subjects interesting for the set-up of the regional Clusters. The composition of the Dorothy partnership, including companies, research institutes, regional Authorities and Municipalities helped also in finding adequate contacts and sources to develop this very demanding study.

This phase of the Project was carried out through diversified techniques, ranging from desk analysis on literature and documentation produced by European Projects, directories of companies to orient interviews with the specific players, focus groups et al.

The main outcomes springing from these activities are reported in the following.

The structure of the market in the sector of Urban Logistics is a quite complex one, with several types of players involved and a “multi-layer” structure, as reported in figure 2.

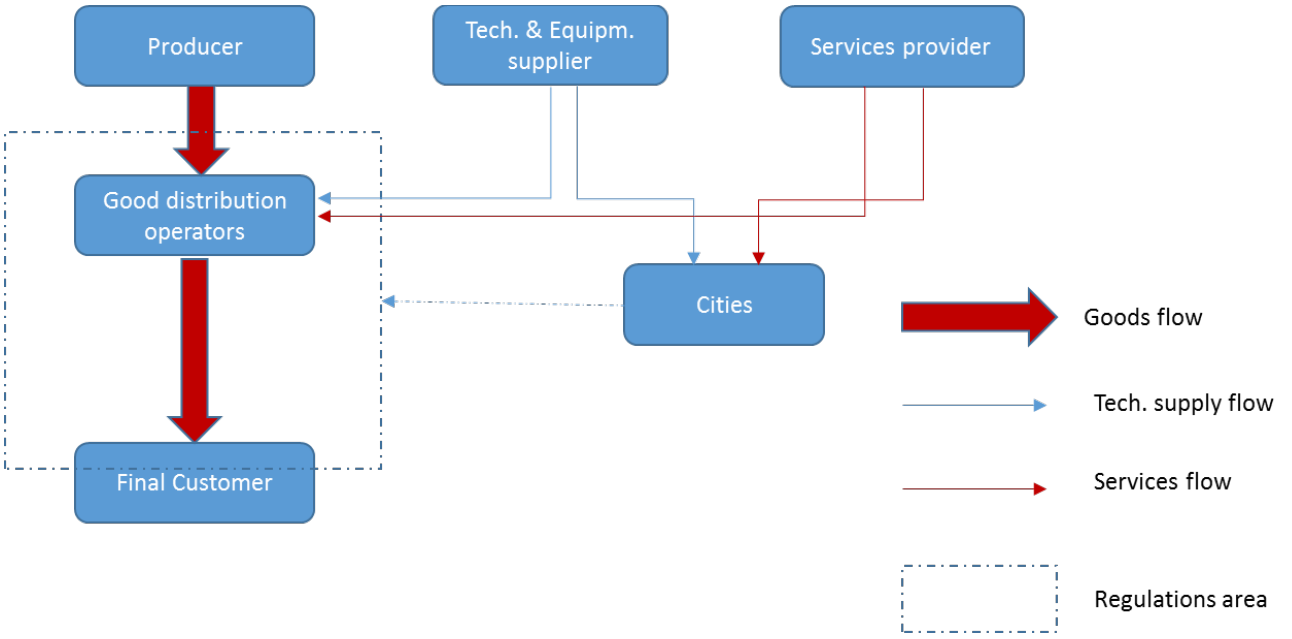


Fig. 2.: The structure of the Urban Logistics Market

The analysis pointed out the importance of the role of Public Administrations in the development of the market of Urban Logistics. This kind of entities is responsible for setting up regulations and controlling the respect of rules and by adopting smart and innovative regulation schemes, they are able:

- significantly influence the cost of urban goods delivery: suitable regulations schemes can limit the times needed for deliveries consequently decreasing their cost
- improve the quality of life in the cities, limiting effects such as noise, pollution, interferences with pedestrians and other traffic, especially in the most valuable parts of the cities
- create new markets for innovative products/services.

The last point is particularly important, in fact, the adoption of advanced and more sophisticated regulation schemes, apart improving the effectiveness of the overall urban delivery system, creates also the need of new ICT based tools for managing these schemes and controlling their application. As an example it can be mentioned the simplest one, i.e. the case of the access restrictions, where ICT based systems to release permissions and control accesses are required. These new applications can have a huge potential market, since they can be replicated in a large number of European cities.

The above reported considerations led to the decision to involve the Regional Municipalities in the development of the work and to devote specific actions to increase their awareness about the available solutions for improving the state of Urban Logistics.

A catalogue of the existing innovation activities in the field of Urban Logistics in the Regions was prepared, including European and national research/innovation projects and other related initiatives.

The analysis pointed out the following aspects:

- Several innovation projects have been carried out, but without a unitary and integrated perspective/approach. While a good level of skills has been detected by the survey, a lack of connections between the different players is also evident.
- The level of the innovation projects carried out is close to the European state of the art.
- In particular there is an insufficient level of integration between Universities and Companies, with limited technological transfer and a few joint initiatives leading to new products/services.
- There is in all the 4 project Regions (Tuscany, Valencia, Oltenia, LVT), even if at a different extent, a sound background about ICT technologies, with the presence of several specialised companies, in particular SMEs. Some of them are already active on the Urban Logistics market, while some others have the skills and the basic competences necessary to work on it. Most of the last are interested to open/enhance their capacity of market penetration into the Urban Logistics sector, enlarging their portfolio of products and services.

A clear indication arising from this analysis was the need to create closer links between the different players, for exploiting all their potential and achieve a mutual benefit. In such a sense the idea of the Cluster as “vehicle for innovation” seemed to be reinforced and validated by the results of the analysis itself. On the other hand, in the entire four partner Regions it was clear that there was a sufficient number of players capable to be involved in the creation of the Clusters.

Another important outcome of the analysis was a clear view of the industrial interests of the companies operating in the Regions and of their propensity to innovation; of great importance also the fact that the majority of those having an innovative attitude are operating in the field of ICT, sometime integrating the latter with mechanics.

The Regional Smart Specialization Strategies (S3) have been also considered for addressing the strategic framework of the Clusters and the JAP in an exhaustive way. It is possible to affirm that there are two cross cutting themes in the S3s of all the four partner Regions, represented by ICT and sustainable urban mobility. These two themes, even if in different ways in relation to the different contexts, represent the two macro-areas in which the Clusters’ strategy will mainly operate.

The described analytical activities were paired with an “on the field” work of scouting mainly aimed to companies and carried out with meetings and direct contacts. The aim was to sensitise the industrial environment about the need of establishing a Cluster in the Regions, explaining its philosophy and benefits.

The process for creating the Clusters was leaded and implemented by the POLIS Cluster (Pole of Innovation operating on Technology for a sustainable City, among which Urban Logistic plays a fundamental role), already active in Tuscany long before the project start. POLIS provided support to the other Regions in order to carry out all the complex activities necessary to set up and start the three new Clusters in the other project Regions, i.e., Valencia, Oltenia and LVT. The creation of the three new clusters was a long process, that took the first eighteen months of the Project itself and was carried out through a very diversified set of actions, ranging from face to face meetings, visits to the potentially interested subjects, public events for the presentation of the initiatives, et al.

Once established the Clusters, the main work of the same and all the project’s teams was devoted to the production of the JAP.

The JAP general strategy was defined in the first step of the Joint Action Plan preparation, starting from the deep analysis carried out during the first phase of the Project and above explained. The JAP mainly reflects the strategic development lines of the Regions in the field of Urban Logistics and defines a way to improve the current situation, according to the general objectives of the Project Dorothy, that it is recalled below:

- Creating opportunities of economic development for the Clusters' members and for the partner Regions;
- Improve the general state of Urban Logistics in the Regions;

The general strategy has then been articulated in a series of specific actions, which have been progressively defined as a result of a long process of debate within the Project and the Clusters' members. The Dorothy partners worked in close cooperation with the Clusters' members for defining the set of actions (JAP actions) to be implemented within the strategic framework, in such a way to be compliant with the industrial interests of the companies, the innovation lines pursued by the research institutes and having a positive fallout for the cities too. Many networking events have been carried out during the Project implementation, in relation to specific application/technological topics, in order to facilitate the exchange of information, the definition of the actions and the set-up of collaboration among the various Clusters and Clusters members.
The definition of the actions, that finally became integral part of the JAP, has been a complex and hard process and the result of a selection of the most interesting and promising ones, among a wide number of actions initially taken into consideration.

The sorting process was carried out on the basis of a deep analytical activity, that took into consideration all the factors analysed and the data collected during the first phase of Dorothy and through a series of additional specific analysis mainly focused on:

- The specific innovation interests of the members of the Clusters; this topic was analysed through direct contacts with companies and research institutes belonging to the clusters themselves. This activity was fundamental to identify the main development lines for the innovation activities (products and services) defined in the JAP.
- Market potential for those actions having a market perspective (mainly innovative products/services). The potential market has been evaluated at a European level, but not as the overall potential market for a certain kind of product/service, rather the part of this market that could be realistically addressed by the Clusters' companies in a five years period.
- The possibility of obtaining resources to fund Clusters' activities, specifically deepened by means of desk analysis and interactions with the Regional Authorities, especially for what concern the use of Structural and Cohesion Funds. The results of this activity have been used to define the financial framework for the implementation of the JAP.
- The potential impact that each action could have. In such a sense, a specific evaluation has been carried out for each single action, taking into consideration four different points of view:
    - Economic: evaluating the potential benefit for the Clusters in terms of additional turnover, potential market expansion or generally better position on the market.
    - Energy and Environment: with regard to the benefits related to saving of fuel and related noise and emissions limitation and improved quality of life coming from the implementation of the JAP actions in the urban environment.
    - Urban: considering the modifications that the adoption of the schemes and techniques suggested by the Jap could generate on issues as:
        - lower number of circulating commercial vehicles;
        - lower interference in the most valuable areas of the cities between the pedestrian and the logistics operations;
        - use of the territory and modifications in the allocation and management of urban spaces;
        - impact of special infrastructures to be created;
        - modifications of the "times of the city".

The improvement of the general logistic organization of the cities was considered as well.

- Social: the evaluation was targeted mainly to point out the following aspects:
  - employment and general improvement of the local level of expertise and professional skills;
  - social opposition to different organization forms;
  - modification of the relationships among different social subjects.

- The definition of the implementation framework. For each single action an analysis of the potential opportunities/barriers and of the points of strength/weakness has been carried out, overall almost a SWAT scheme. This activity was performed with the aim to point out eventual insuperable difficulties for some actions or to identify possible accompanying measures to be carried out to ease up the implementation of the actions. The most important topics approached were:
  - The normative and regulation framework, that is always very important at the purpose of implementing the majority of Urban Logistics actions. A specific document reporting the local normative conditions in the four Regions has been produced; in some case, to exploit the full potential of some actions since there is the need of a modification of the current normative framework in some realities. In other cases the homogenisation of some rules in the different European countries would be a great stimulus for the enlargement of the market for specific products.
  - Socio – organisational aspects. The work was mainly addressed to point out situations of possible conflict among the various stakeholders and to prevent them using inappropriate measures in the implementation of the actions. Another faced issue was related to the management of possible social opposition to some of the JAP measures; finally the possible organisational modifications to be brought to the Urban Logistics process management have been considered to point out eventual critical points.

The JAP was published after two years and a half since the project start and it was widely disseminated in the 4 Dorothy Regions toward the most important and relevant stakeholders (i.e. Regional authorities, Municipalities et al.). At least one specific public event (called the Regional Dorothy Roadshow event) has been organised in each one of the Regions, with the presence of the Dorothy management and partners to illustrate and promote the JAP toward the most important stakeholders. The 4 roadshow events were very successful, involved a significant number of persons (globally more than 400 stakeholders have been involved) and represented also the occasion to set up new ideas for cooperation and new projects start up.

A particular aspect of the JAP formulation was represented by the specific attention given to the internationalisation of the Clusters. A targeted strategy defining a roadmap to the first steps of the presence of some of the Clusters' members on the extra-EU markets was elaborated and a limited set of countries to be approached and the relevant first steps to be carried out in each of them have been defined too. Methodologically speaking, a bottom-up strategy was followed, the latter tried to leverage on the already existing set of relationships, for maximising the success chances in the short- medium term. The selection process, with respect to the internationalisation strategy, took into account the following elements:

- the real possibility to approach the country for a stable cooperation;
- the existing links;
- the potential of development of urban logistics;
- the dimension of the cities where the project results could be transferred;
- the level of interest by the non EU partners;
- the general perspectives for the country.

The approach led to the selection of four potentially interesting countries with the definition of a specific approach strategy for each one of them.

In the end, contacts with the regional associations and bodies to support the internationalisation of companies have been taken to start a cooperation process.

The last part of the Project was devoted to start the actual implementation of the JAP actions. For each one of the JAP actions a working group of Dorothy partners and/or Clusters' members from the different Regions was created and put under the coordination of a single subject. The groups worked during the last few months of the Dorothy project and will keep doing that after the project termination too, so to set up the different actions, as better explained in the following.

A lot of attention was paid during all the development of the Dorothy Project to the methodological approach, since it represented the key element for ensuring:

- the compliance of the defined strategic lines to the reality and the needs of the Regions
- the real possibility to implement the defined JAP actions
- the durability over the time of the Clusters and of the cooperation mechanisms set up during the project.

It is also very important to highlight the huge effort devoted to communication and dissemination activities. The latter were constant tasks of the project, that followed step by step, the whole duration of Dorothy and allowed for a great return of image, but most of all for a facilitation in the networking a on the filed activities. Different kind of disseminations techniques have been used during the different phases of the project, in order to fit the many needs, ordinary and/or extemporaneous. At the same time, the main targets of these activities have been time by time different. As an example we can cite how at the moment to collect subject for the Clusters constitution, the main dissemination activities were targeted toward the local companies or institutions for sensitising them toward the benefits of the Clusters, through direct contacts and specific meetings and focus groups. On the contrary, when the JAP was ready a great effort was carried out for disseminating it and stress its importance, toward all the Regional stakeholders using large promotional events, publications and other macro actions. The communication and dissemination activities really constituted an effective working tool for the project, fully integrated in all the operational activities.

c. Overall achievements

The main achievements of Dorothy project, separately described below, can be categorized as it follows:

- Creation of the regional Clusters and their operational start up in the three provided regions, i.e., Oltenia, Valencia and LVT.
- Production of the JAP.
- Start-up of the implementation of the JAP actions
- The internationalisation process

The creation of the regional Clusters and their operational start up

By the project mid-term all the regional Clusters were constituted and fully active, according to the work programme.

The new regional Clusters on Urban Logistics were created in three precise regions: Valencia Community (Spain), Lisbon and Tago Valley Region (Portugal) and Oltenia (Romania). The already existing Tuscany Custer, POLIS, had the role of tutoring/coaching/mentoring/monitoring the whole process for the creation of the Clusters in the three aforementioned regions, providing methodological and operational support.

The Clusters represent a fundamental part of the Dorothy strategy for innovation in Urban Logistics in the 4 partner Regions, since they are the subjects that will drive the process for the implementation of the JAP and will make this a on going mechanism, being the clusters permanent structures with strong relationships. It goes without saying that they will also gradually update their strategic plans, starting from the defined JAP, but paying attention to the new needs and realities at the same time.

Clusters are, as a matter of fact, inspired by the EU guidelines for research, development and innovation (2006/C 323/1), and have the aim of coordinating research centres and companies' initiatives and encouraging the dialogue between research and manufacturing world, to make the interventions for innovation more targeted, flexible and effective, and in line with the different productive systems.

It is relevant to underline that in the case of Urban Logistics, given the role of Public Authorities already explained above, the Clusters often include representatives from the most important cities of the Regions; in some cases, also associations of citizens are involved. This choice is/was in any case different from Region to Region, in accordance to stakeholders and clusters regional strategies, which are always synergic, but in some case, in order to be more effective require or not the involvement of the just mentioned subjects. Something similar happened in respect to the legal form of the Clusters, which were diversified site by site, ranging from juridical personality to association and other. The single Regions choose among the possible schemes the one fitting closely the local needs and representing the most simple, quick viable solution.

At the moment the four regional Clusters have the following characteristics.

Globally they involve 118 members, 3 associated members and 4 supporting entities distributed in the Regions as shown in the following table.

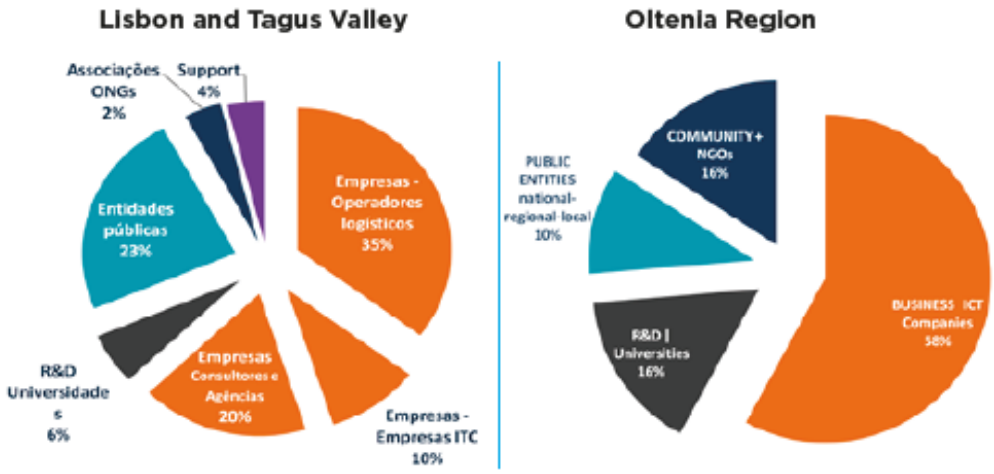
Urban Logistics CLUSTERS		Full Members	Associated Members	Support Entities
		(October 2015)		
CLUSTER	Tuscany Region	33	3	2
CLUSTER	Lisbon and Tagus Valley Region	49	0	2
CLUSTER	Valencia Region	17	0	0
CLUSTER	Oltenia Region	19	0	0
	TOTAL	118	3	4

Composition of the Dorothy regional Clusters

In the case of the Tuscany cluster, associated members are public entities (Municipalities, Provinces/Metropolitan City, Region) who, by law, cannot be full cluster members. Support entities are not cluster members, but give support to them (as a technology cluster active at the national level, on cross-cutting technologies with several interesting fields and not just Urban Logistics).

It is important to point out the significant number of entities that joined the new clusters, notwithstanding their newly born status. This level of participation might be a good indicator that the stakeholders involved in Urban Logistics recognise the need for a strategy or at least for a common platform of communication within the Regions.

The next pie charts offer a further insight into the structure of the four regional clusters.

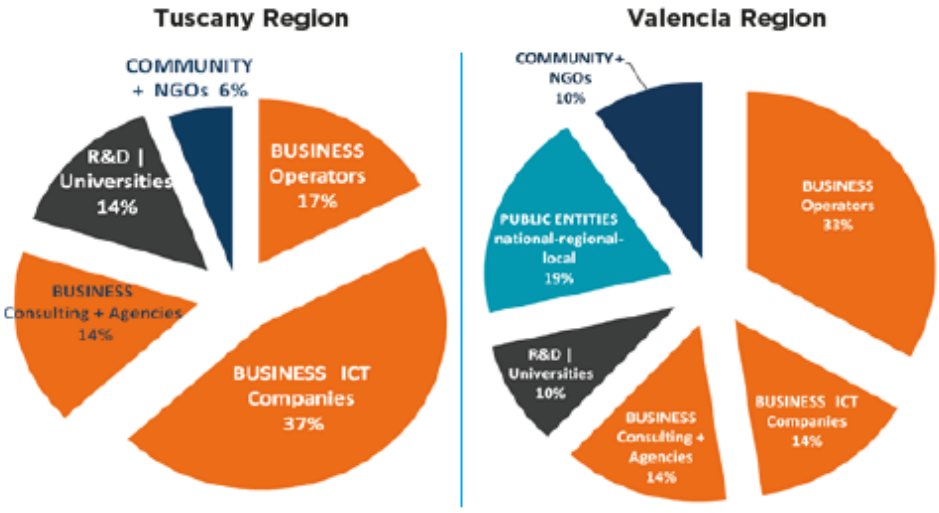


The Lisbon and Tagus Valley Region Urban Logistics cluster was formally constituted with 35 entities. The activities of Urban Logistics cluster of the Lisbon and Tagus Valley Region are focused on the following 5 anchor initiatives:

- ITS applied to Urban Logistics solutions.
- Planning, harmonisation and regulation of logistics in urban public space.
- Eco zones and city logistics.
- Consolidation solutions in cities.
- Micro Urban logistics.

The Oltenia Region Urban Logistics cluster has among its partners entities focused on the following topics:

- Special software for freight distribution systems.
- Support systems for regulation schemes.
- Storage systems for transport.
- Non-conventional vehicles.
- Electronic devices for goods and vehicle tracking.



More than 650 partners compose the Tuscany Region Urban Logistics cluster POLIS, settled by the Tuscany Region in 2011. The partners belonging to the field of mobility and logistics are interested in the following topics:

- New vehicles.
- Intermodal integration.
- Info mobility and ICT systems for supporting regulation.

The aim of the cluster management board is to consolidate the results achieved in the past years and support the internationalisation of Tuscan enterprises through a flagship initiative as described in actions focused on the collaboration with additional EU countries and included in the DOROTHY JAP.

The Valencia Region Urban Logistics cluster is composed by logistics operators, carriers, regional and local authorities, universities and other research institutes as well as technology suppliers associated with Urban Logistics and other companies with special relevance in the distribution of goods. Settled in 2014, there are currently 17 main partners, including the University of Valencia, one large supermarket chain, large technological companies, large delivery companies, foundation on transports and logistics promotion, city councils, public service companies and one electric vehicle manufacturer.

The main industrial interests are concerned with:

- New schemes for urban freight distribution (such as use of cargo bikes, etc.)
- ICT for supporting Urban Logistics.
- Vehicles for goods distribution.

The production of the JAP

The production of the JAP was the second pillar of the Project and one of the main objectives of the same. According to the EU RoK (Region of Knowledge) Program the Joint Action Plan (JAP) is an instrument able to drive economic development through research and technological development activities in a selected topic or economic sector, in our case the Urban Logistics sector.

In general terms a JAP should develop the following activities:

- Analyse the development needs and objectives justifying the JAP.
- Analyse information on the geographic coverage and target groups of the JAP itself.
- Identify the partners, activities responsibilities and schedule for trans-national and cross-regional cooperation.
- Set out a business plan, defining how to finance the JAP by using possibilities available at national/local level, including the private sector, or at Community level.
- Define the expected implementation period of the JAP.
- Make clear the complementarities between the proposed actions and the EC regional policy programmes of the Region(s) concerned.
- Consider the use of financial instruments such as Horizon 2020, the Competitiveness and Innovation Programme, and Structural Funds, as well as national and regional resources and financing from the private sector, to implement the JAP.
- Develop an analysis of the effects of the JAP on the promotion of sustainable development, where appropriate.

A JAP must be also composed of a set of actions:

- Exhaustive: capable of involving all the stakeholders and addressing all the elements of the mentioned scheme.

- Integrated and complementary: to maximise the effects.
- Compliant with the structure and the interests of the cluster.
- In line with the smart specialisation of the Region.
- Effective: capable of significantly improving the state of Urban Logistics along its whole chain.

Moreover, a JAP may be comprised of regionally specific activities and it could include the design of measures such as:

- Innovation measures to facilitate the development of new products, services and processes on the grounds of excellent research results and recruitment of innovation assistants.
- Improving and sharing RTD infrastructure and other facilities.
- Identifying relevant (collaborative) research and technological development related projects.

The Dorothy project developed its JAP according to the aforementioned guidelines, formulating the different points according to the specificity of the application field (Urban Logistics) and of the partners Regions.

The Urban Logistics very complex application environment required/forced to design an articulated set of integrated actions to achieve the expected outcomes. In order to comply with the peculiar characteristics of the Urban Logistics market, the large number of stakeholders involved and the direct impact on urban and social issues, the DOROTHY team was forced to widen the visual angle. So different kind of actions have been considered, addressing not only the clusters' economic development, but also targeting complementary very important objectives:

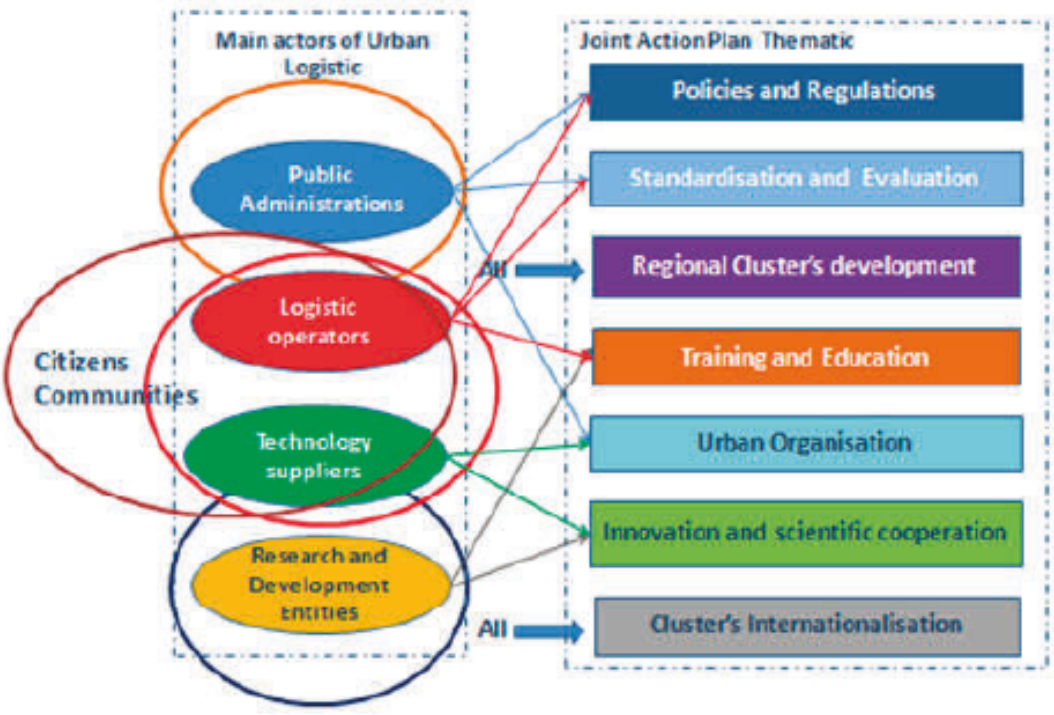
- Sensitising the public administrations.
- Creating the local conditions for an improvement of the market.
- Ensuring the long-term stability of the clusters.

According to this philosophy, DOROTHY has defined a structure of the JAP based on 7 Thematic Areas, each of them containing a set of specific actions. Each Thematic Area addresses a specific aspect of the overall Urban Logistics process and of the Clusters' organisation and is aimed to specific stakeholders. These Thematic Areas are integrated and complementary, but can be approached separately with specific actions capable of achieving concrete results by themselves.

The DOROTHY Thematic Areas are:

- Policies and Regulations
- Standardisation and Evaluation
- Regional Clusters' Development
- Training and Education
- Urban Organisation
- Innovation and Scientific Cooperation
- Clusters' Internationalisation

The philosophy and the interconnection between clusters, stakeholders and JAP Thematic Areas are represented in the following picture, where the circles represent the four elements of the clusters and the main players of the city logistics are put in evidence with their connections with each specific Thematic Area. This organisation seems the best way to comply with the general specification of a JAP itself in terms of exhaustiveness, effectiveness, integration and complementarity and compliancy with the structure and the interests of the clusters, as above reported.



The Dorothy 7 Thematic Areas (TA)

The following table reports for each Thematic Area the general objectives and the main players.

Each Thematic Area is composed by a set of “actions”, which represent single “units of work” that can be carried out independently from the others, even if all the actions are integrated in a unitary framework and are complementary to each other. Each action has specific objectives, players and identifiable benefits and the combined effect of the implementation of several actions in the same territorial environment can create additional beneficial effects.

Each action is described in the JAP with the following bullet point scheme:

- Objectives
- Urban Logistics framework
- Action description
  - Contents and organization of the action
  - Required skills and expertise
  - Existing products/experiences
  - Stakeholders and beneficiaries of the action
- Evaluation of impact
  - Normative framework
  - Reference market and economic impact
  - Environmental impact
  - Social impact
  - Urban impact
- Drivers/barriers and accompanying measures
- Financial plan for the implementation of the action.

It’s of great importance to keep well in mind that the actions selected to be included in the JAP are not all the possible actions that could be implemented to improve the situation of Urban Logistics in the Regions. They are a subset of the bigger ensemble, selected to be:

- Realistically possible to be implemented in the short-medium term

- Interesting for the members of the Clusters
- With a significant expected positive impact on the Clusters
- In line with the defined general strategy
- Aligned with the Smart Specialization Strategy (S3) of each project involved Regions

Right below a short description of each Thematic Area and list of relevant actions

ACTION FIELDS	General Objectives	Main Players
Policies and Regulations	To support the application of specific policies by the Regions and the cities to improve the state of Urban Logistics in the Regions.	Regions, Cities
Evaluation and Standardisation	To set up a standardisation process in regulatory frameworks and other related aspects to ease the implementation of Urban Logistics processes in the cities. To define tools to improve the knowledge of Urban Logistics schemes and related aspects by the cities.	Regions, Cities, Urban Logistics operators, universities and specialised companies
Regional Clusters' Development	To identify actions to foster the development of the Regional Urban Logistics clusters.	Cluster's companies, universities and research institutes
Training and Education	To identify actions capable of increasing the level of knowledge about Urban Logistics in the Regions. To increase the skill of personnel involved in Urban Logistics in the Regions. To create competence centres in the Regions about Urban Logistics capable of ensuring continuity in the development and to create a better links between research institutions and companies.	As promoters and organisers: Regions, universities, specialised companies. As users : cities, Urban Logistics operators; other companies.
Urban Organisation	To identify models of organisation of urban spaces and infrastructures targeted at improving the state of Urban Logistics in cities.	Cities, Urban Logistics operators, specialised companies
Innovation and Scientific Cooperation	To promote cooperation among the different Clusters. To identify actions targeted at supporting innovation and cooperation among clusters' companies and universities and research institutes. To identify possible funding sources for the aforementioned activities.	Regions, clusters, universities, research institutes
Clusters' Internationalisation	To identify actions to support the internationalisation process by the clusters' companies.	Regions, clusters, companies

The characterization of the Thematic Areas

Policies and regulations

During the analysis carried out in the Regions by the DOROTHY project, some facts have been identified, representing a significant limit to the adoption of innovative Urban Logistics schemes in cities. Such limitations can be summarised as it follows:

- Urban logistics, while being an important part of the mobility topic, is not perceived as important as "mobility of persons". It is most of the time considered a "matter for specialists", receiving thus limited attention, especially by policy makers; as a consequence planning activities on Urban Logistics are often limited or neglected. It's then rightful to affirm that a strong effort to include Urban Logistics in the framework of mobility and urban planning must be made.
- There is a lack of knowledge by the cities about innovative Urban Logistics management schemes, technological support and solutions and how they can support specific policies. The potential of technologies, as key factors for contributing to the solution of problems, is not known and this prevents their current use in the urban environment.

The proposed actions to improve the current situation are based on the following main pillars.

SUSTAINABLE URBAN LOGISTICS PLAN

As central strategy for the improvement of Urban Mobility, the 2013 Urban Mobility Package sets out the concept for a Sustainable Urban Mobility Plan (SUMP), a long-term strategy for future development of the urban area, with a delivery plan for its short-term implementation. The main goal of a SUMP is to improve accessibility of urban areas and provide high-quality and sustainable mobility and transport to, through and within the urban area.
The European Commission is working closely with the Member States to ensure that the SUMP concept is adapted to the specific requirements and existing planning practices in each Member State and is actively promoted at national level, in order to reach hundreds of cities in Europe.
The Dorothy Project focus the attention of the partner Regions to promote the adoption of SUMPs containing a special section devoted to Urban Logistics (named SULP – Sustainable Urban Logistics Plan).

URBAN LOGISTICS POLICIES; REGULATIONS AND SUPPORTING TECHNOLOGIES

The second action foreseen by the JAP within the present Thematic Area is the realization and diffusion of a "catalogue" of regulation policies and related supporting technologies and organisational measures. The catalogue should encourage innovative solutions and could further include assessments of the urban profile of cities, in order to establish tailor made solutions to maximise economic, social and environmental benefits. A lot of material is available coming from a significant number of projects that have been carried out and successful experiences implemented at a European level. The catalogue could be a fruitful stimulus for local policy makers to implement more advanced solutions for Urban Logistics and could also increase the level of awareness about these topics.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Regulations and policies		
1.1	Sustainable Urban Logistics Plan (SULP)	To push Regions to define regulations targeted at supporting and incentivize the elaboration of a SULP for cities over a certain population.
1.2	UL policies, regulations and supporting technologies	Target of this actions is to create a tool addressed to the cities for easing the decision making process for Urban Logistic. This could be the design of a "catalogue" of regulation policies and related supporting technologies and organization measures. A particular approach has to be used: a clear view of the links between

		the type of regulation / norm and its effects/objectives, as a well as the needs of supporting tools and technologies. This manual should be a synthetic support for decision makers to the analysis of the regulation schemes available to support their objectives in the field of Urban Logistics.

Standardisation and evaluation

Although general logistics is an activity with a quite high level of standardisation (e.g. barcodes, containers, racks, pallets et al.) one of the weak points revealed by the DOROTHY project is that there is a very low level of standardisation among different cities, even in the same region, about all the aspects related to Urban Logistics. This lack of standardisation is often linked not so much to logistics operators, but to the different regulations and procedures adopted by cities, making the work of logistics operators more difficult and often very expensive.
The just described low level of standardisation is often worsened by the scarce information about the goods distribution process made available by the cities. The nature of Urban Logistics activities implies the interaction of several agents, with different roles and motivations, operating in a common territory with the objective of making logistics operations in the last mile sustainable and more efficient. As a consequence, better information means better management of Urban Logistics operations too.
Another very important related problem is the low capacity by cities to evaluate their needs in terms of Urban Logistics and how far they are from their expected (or desired) targets. Often local decision makers have a scarce awareness of the state of Urban Logistics in their city or it is not in line with "acceptable qualitative and quantitative standards. This difficulty in carrying out a correct diagnosis also makes it more difficult to adopt suitable policies and regulation schemes.
For improving this situation, the DOROTHY JAP has foreseen three different and complementary actions in this area.

EVALUATING URBAN LOGISTICS PERFORMANCES: URBAN LOGISTICS PERFORMANCE INDEX

The first action is about evaluation of Urban Logistics, in fact, appropriate instruments are required to support decision makers, mainly the public authorities. These kind of instruments are still lacking, in fact, while theoretical works and comprehensive index systems for the evaluation of logistics chains are available, a tool that only requires a limited set of data to be used, which is conceived for urban realities and can represent a common ground for understanding for decision makers and specialists about the local status of Urban Logistics is still absent. The action is targeted at developing a methodology for giving aggregate and quality information to support the decision making process. This methodology will give the possibility of benchmarking different cities and regions, so as to compare how far each city is from achieving its own objectives. In this regard the present action is strictly integrated with the actions related to policies and regulation schemes, as the evaluation methodology can be a preliminary interpretative tool that can address the consequent decisions about Urban Logistics regulation schemes.

OPEN DATA AVAILABILITY AND STANDARDISATION

The second action is therefore devoted at stimulating cities to make data available and information accessible, by adopting the paradigm of open data. Open data platforms and applications have been raised as one of the most promising solutions to support Urban Logistics improvement with flexible, effective and low cost services. The widespread diffusion of mobile devices, sensors and

geo-referred data offers additional opportunities and material for the publication and use of open data to implement new vertical solutions for Urban Logistics purposes. However, an effective use of open data requires shared standards and protocols for data collection and interchange, and this is the reason why this JAP action takes into consideration, not only policies for increasing the use of open data, but also the definition and adherence of standards for Urban Logistics data.
This action is particularly important as it is linked to other actions, which are targeted to develop products/applications based on the availability of these data.

REGIONAL URBAN LOGISTICS ACCREDITATION SYSTEMS
A particular aspect of the management of the Urban Logistics process is the one linked to permissions delivery by the cities to logistics operators. The total lack of standardisation, the different regulatory frameworks and administrative procedures - which can be very different, even in neighbouring cities - makes the management of this process very hard and complex for logistics operators.
Following the positive experiences carried out in other sectors, this action foresees the creation of a regional accreditation platform for Urban Logistics operators. The platform, based on the availability of on-line information about local regulations for goods distribution, gives the possibility of releasing permissions with a standardised on-line administrative procedure. While each city can adopt its own rules for regulating access, parking and all the other aspects, it does use at the same time a standardised procedure for managing the permissions release procedures.
The platform will/could also represent a general marketable product.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Standardization and monitoring		
2.1	Urban logistics performance index.	To define an implementation hypothesis of the index and its elaboration methodologies; to include this action in the activities funded by the regions; to identify other possible funding sources; to set up cooperation among Clusters in this field; to develop a "proof of concept" within the Dorothy project.
2.2	Open data availability and standardisation	To push Regions to request Cities over a certain population to make available updated data about UL as open data in defined formats and on defined platforms and define a policy supporting this choice.
2.3	Regional UL accreditation system	To push Regional authorities to set up a classification system for UL operators and to implement a technology based support for their accreditation accessible to all municipal offices.

Regional Clusters development

This specific Thematic Area is directly linked to the business development of the Clusters and the member companies. It contains actions targeted at the development of specific innovative products/services that can strengthen the position of the clusters' companies on the market, open

new opportunities and qualify them from the technological point of view. It can be said that this Thematic Area is one of those where short term achievements are expected and whose actions are closer to the immediate interests of the clusters' industrial environment.
A limited number of potentially interested initiatives have been identified, on which the effort will be focused in the initial Clusters' development phases. Their selection has been carried out in close relation with the clusters' companies, as described in the section devoted to the Project methodology.
The carried out analysis have very clearly pointed out that two technologies are the most relevant for the Clusters:

- Information and communication technology (ICT) with its specific applications to Urban Logistics.
- Mechatronics.

The main markets to which the selected products are targeted are:

- The market of Municipalities, and other authorities managing the Urban Logistics as main target.
- The market of Urban Logistics operators.

Based on this preliminary analysis, a second deeper analysis has been carried out for defining a set of products/services to be developed within the Clusters with the target of having marketable products in a short-medium period. Three specific product/service lines have been identified, according to the following criteria:

- They are compliant with the above explained strategy.
- They can have a potential wide market in Europe and can also be suitable for international development.
- They require a sustainable effort for the current capacities of the clusters.
- They can be developed in the short-medium period.
- They can be implemented and tested in the "captive" environment of the clusters.
- They outline a concrete cooperation framework among the clusters.

Each of the identified product/service lines has been associated with a single action foreseeing its development and testing.

INNOVATIVE ICT SOLUTIONS TO SUPPORT ADVANCED URBAN LOGISTICS REGULATION SCHEMES

Several companies belonging to different clusters can operate on this action, whose objective is to specify and develop this class of innovative products. At the same time, one specific objective of the action is to push regions to include this subject in their support actions (e.g. launching targeted tenders for the implementation of this kind of initiatives and to identify possible funding sources etc.). This action is quite complementary to those included in Thematic Area 1 about regulations. In fact, while Thematic Area 1 is aimed at creating a normative and policy environment, this action is targeted at developing the relevant support systems based on ICT.

OPEN DATA ARCHITECTURES TO SUPPORT URBAN LOGISTICS

Specific platforms devoted to Urban Logistics, highly specialised in managing open data can have a growing importance and are a focus of interest for the clusters' companies, the approach to this action is the same as mentioned for the preceding ones. The action is complementary with the one reported in Thematic Area 2 about the availability of Open Data by public bodies and is strongly linked with the regional accreditation system for Urban Logistics operators, which represents a specific application of this philosophy and this platform.

PROXIMITY DELIVERY AREAS

The topic is of peculiar importance for historic cities and generally speaking for city centres. The action makes reference to innovative classes of products that are the evolution of the existing ones, targeted at exploiting a specific market that at the moment is a niche, but can grow significantly when suitable products will become available. In this case, as in the previous, the target is to specify and develop this class of innovative products and to carry out pilot applications for testing and dissemination purposes.

In addition, two more general actions targeted at fostering the general development of innovation in the Clusters have been identified.

COOPERATION AGREEMENT AMONG THE DOROTHY CLUSTERS

It consists in the definition and signature of a cooperation agreement among the clusters for the implementation of the JAP and to define further collaborations after the end of the DOROTHY project.
The four clusters have already signed a first version of the Memorandum of Understanding (MoU), on 28th October 2015, during the Policy Event in Valencia.

COOPERATION WITH OTHER EXISTING CLUSTERS AND NETWORKS

The present action is devoted to enlarge the international cooperation framework and consists of identifying already existing clusters and European or international networks or platforms to connect with. This will ease the future set up of research consortia for R&D funding or other innovative initiatives. Participation in these wide transnational networks is a crucial point of competitiveness in the research framework that is defined at the European level.
This action has a strong relation with the one about the Urban Logistics Observatory included in Thematic Area 6.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Regional Clusters' development		
3.1	Innovative ICT solutions to support advanced UL regulation schemes	Identification and development of a class of products to be developed by the Clusters' companies; to push regions to include this specific subject in UL planning; to push regions for launching specific tenders for the implementation of this kind of initiatives
3.2	Open data architectures to support urban logistics	To identify a possible class of products to be developed at the benefit of the Clusters' companies; to push Regions to include this specific subject in their planning
3.3	Proximity delivery areas	To identify a possible class of products to be developed at the benefit of the Clusters' companies; to push Regions to include this specific subject in their planning
3.4	Cooperation agreement among the Dorothy Clusters	Definition and signature of a cooperation agreement among the Dorothy Clusters for JAP implementation and to define

		further collaborations after the end of Dorothy.
3.5	Cooperation with other existing Clusters and networks	To identify already existing Clusters and European or international networks or platforms to connect with. This at the purpose of easing future set up of research consortia for R&D funding or other initiatives.

Training and education

The qualification of human resources is a topic of paramount importance when working for innovation. One of the main objectives of the DOROTHY clusters, namely just innovation, can be pursued only with a continuous programme of qualification of personnel, at any levels.
Moreover, putting together companies, public institutions and research institutions belonging to the clusters, with middle-long term objectives for planning the development of the skills and qualification of their personnel and fleet managers, is indeed an effective way of creating permanent links between the research, local administrations and the industrial environment.
This approach has several positive effects:
It pushes industrial companies to link technological and market development to human resources qualification with a foresight to future trends. This can result, not only in an improved qualitative level of personnel, but also in better capacities for strategic planning.
It can fill the cultural gap between industrial companies and research institutions, creating osmosis between these two worlds, and in doing so feeding future joint development and trigger further innovation mechanisms.
It stimulates companies to overcome the short-term vision of immediate interest and to cooperate with other companies on more ambitious targets.

The need to focus the clusters' attention on education and training is also strengthened by the fact that, in the academic world and in the wide market of professional training, there is a lack of specific initiatives in Urban Logistics.
It is possible to distinguish two types of different needs and related actions to fulfil these needs:

- The first is a general growth of specialised knowledge in the field of Urban Logistics, including all the related basic methodologies and technologies. This need is linked to a medium-term strategy of growth in the regions of a high-qualified scientific and technological environment that could support the future development of the clusters.
- The second is related to the needs of the clusters, mainly their industrial and service companies, engaged in the effort of developing innovative products and approaching new markets as well as of their local administration bodies. This action is focused on specific targets and for this reason can vary very much in time, implementation modes, etc.

Reflecting this situation, this area includes two actions designed to satisfy the above mentioned needs.

INTERNATIONAL HIGH LEVEL MASTER DEGREE IN URBAN LOGISTICS.
The fundamental objective is to achieve a high level of specialization in Urban Logistics, with a periodic character (annual or biannual), to be targeted at graduate students or selected staff from the different stakeholders involved in Urban Logistics. This will be a vocational environment of international cooperation among the clusters, but it will also be open to the stimulus coming from the local territories, to be compliant with the local needs.

STAFF TRAINING FOR PERSONNEL ON NEW URBAN LOGISTICS SCHEMES AND TECHNIQUES

The second is a typical training action, addressed to specialized personnel from companies, fleet managers from local administration or research institutes, aimed at improving their knowledge about specific innovative themes required for their professional activities. This can include both specific topics related to the implementation of defined projects or professional updating to follow technological or methodological innovations. These training activities will be generally limited in duration, but continuous over the time. The training methodologies could be different from time to time, ranging from traditional lessons to meetings, workshops, technical visits and other activities.
It is important to point out that these actions will have in time the character of continuity and will be the most important point of continuous contact between the industrial, local administration and the academic world represented in the clusters.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Training and education		
4.1	High level international master degree in Urban Logistics	Definition of a master degree in UL to be supported by the Regions in a unitary perspective
4.1	Staff training for personnel on new UL schemes and techniques	Definition of a set of training initiatives to be included by the Regions in their planning for professional training and education.

Urban organisation

European cities, unlike American ones for instance, developed around an original core, often thousands of years old (the historic centre), with limited capacity in terms of roads and spaces, difficult to modify to suit changing social needs and logistics one. Historic centres are places of aggregation of all the major activities of the city, namely administrative, financial services major businesses and they are increasingly protected with large pedestrian zones or areas restricted to traffic. Around the old city, large peripheral areas develop, often with a concentric shape, sometimes characterised by industrial activities and less intensive building zones. The road system, which is organised around the historic centre, often through major roads, tends to create accessibility along the peripheral ring. This accessibility essentially creates a new centrality that attracts businesses requiring large spaces, and that can be accessed mainly by private car.
Not only do urban centres create a high demand for goods supply, but it is also difficult to make logistic operations compatible with this kind of urban structure. Goods distribution, in fact, has an important impact on historic centres in terms of space occupation, traffic flows, air quality, noise and general interference with pedestrians.
In this particular case, several cities belonging to the four DOROTHY Regions are historic cities with important architectural heritage to be protected and with a particular centrality of the historic centres that represent the most vital and valuable part of the city. To improve the quality of the urban environment by satisfying the needs for movement of goods, more sophisticated and smart solutions are necessary.
The DOROTHY project has faced this problem through specific actions already described in other Thematic Areas targeted at improving the adoption of more sophisticated regulations and policies (see Thematic Areas 1 and 2) and to provide tools to manage these new schemes (see Thematic Area 3). Within this Thematic Area, the problem is approached from the point of view of the direct impact on the cities. The present Thematic Area deals with innovative techniques for distributing goods that interfere less with the liveability of urban centres.

The analysis carried out during the DOROTHY project has in particular identified two actions that are suitable for the local realities

"CARGO BIKE" FOR DELIVERY IN URBAN CENTERS

The action is devoted to promote the use of cargo bikes in Urban Logistics, for this reason, it will address the policy framework and improvement of the infrastructure.
The use of cargo bikes aims at guaranteeing a regular delivery service for all the commercial activities located in urban areas, especially in the city centres, in a more sustainable way. The area and the residents, then, can benefit from environmental enhancements, and logistic companies can obtain notable cost savings and better reputations.
The action is feasible for large and medium size cities and sprawling urban areas, where an appropriate regulatory framework can stimulate the usage of cargo bikes for urban freight transport.
This action can create occupation through new small specialised enterprises.

ORGANISING A NETWORK OF OPERATORS IN THE CITIES FOR IMPLEMENTING ROXIMITY DELIVERY POINTS FOR PARCELS

The action aims at defining an Urban Logistics scheme for the last mile delivery and to identify measures and incentives for setting up a proper systems' governance.
The idea is to implement an easy and low cost system, based on the needs of cities, consumers and operators, to be adopted by the cities as the only or strongly suggested way to deliver parcels in the city centres.
The system will consist in equipping appropriate locations, i.e. small businesses like drugstores, dry cleaners, cafes, kiosks, with a small storage area where couriers' drivers can leave packages for customers to retrieve later.
The use of this kind of proximity delivery point means cost savings for logistic operators, in terms of fewer repeated deliveries at homes for the consumers, who could go to a delivery point near their home by walking, and for the city, due to the reduction in the number of vehicles circulating on the roads.
This action can sustain some categories of economic operators and can also be an opportunity for technological development, as this technique requires technological supports to manage the operations.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Urban Organisation		
5.1	Supporting the use of "Cargo bike" for delivery in urban centres	The objectives of this action are twofold: • Creating the conditions for easing the use of cargo-bikes in the cities; identifying possible incentives for operators using cargo bikes • Supporting the industrial initiatives of the Clusters for improving the existing cargo-bike services

5.2	Organizing a network of operators in the cities for implementing proximity delivery points for parcels	Identifying the practices for organising a scheme of UL based on proximity delivery points implemented not through technological delivery equipment but through the use of commercial operators' networks. Also in this case the action has also a "productive perspective", as the management of such a distribution scheme needs some information tool to manage this intermediate delivery points (hw and sw) that could be of interest for some Cluster's companies

Innovation and scientific cooperation

Innovation is a concept and a principle on which the DOROTHY clusters were founded upon to, since it represents the key element to increase the competitiveness of clusters and of their companies. Cooperation is the other cornerstone of the DOROTHY architecture, as it can strengthen the position of the clusters, valuing complementarities and encouraging integrations among all the clusters' members.
The actions developed within this topic are specifically targeted to boost up the cooperation among the clusters themselves and all the clusters' members, with the clear purpose of promoting innovation in the Urban Logistics sector.
The analysis carried out during the DOROTHY project has detected the following issues:

- The existence of a significant number of RTDI initiatives in the Regions, but with a very low level of integration. This is indeed an indicator of a good qualitative level in the productive environment within the Regions, especially in the technological and market sectors that have been included in the JAP as reference targets. On the other side, the lack of integration towards common objectives leads to duplication of activities, lower critical mass and dispersion of effort, time, money et al.
- There is insufficient cooperation between Universities and Companies. This is an old trait of the relationships between these two worlds, which is still hard to overcome. In this sense, the clusters are definitely a suitable response, but the structure itself cannot ensure the result and must be supported with targeted specific actions.
- The clear indication coming from the performed analysis is that there is a large potential for innovation in the regions that should be adequately exploited. The clusters themselves offer opportunities, constituted by the possibility of dialogue among different companies and with the academic environment and the existence of a continuous coordination provided by the clusters' management. The DOROTHY project aim to leverage these strengths for improving links among all the different realities of the clusters and for enhancing their cooperation and capacities.

In the just presented context, the JAP recommends three integrated actions.

A MATCH MAKING WEB BASED PLATFORM FOR URBAN LOGISTICS CLUSTERS

The overall concept is the implementation of a matchmaking web-based platform, to facilitate knowledge sharing and to build relationships between enterprises and research groups of the DOROTHY clusters. The platform is conceived to become a daily working tool for the clusters and their companies and can be used for different purposes: finding partnerships for specific projects within it, but above all, outside the clusters, sharing information, exploring business opportunities,

etc. It will be a working tool, able to create a permanent link among the clusters, in fact, it will enable the development of joint activities (e.g. technological practices, operational measures, online seminars,) to approach Urban Logistics problems, improving efficiency and innovation acceptance in this area. The platform is open to future developments for integrating other tools for exchanging information and knowledge, creating communities, et al.

COOPERATION BETWEEN THE RESEARCH CENTRES AND THE UNIVERSITIES OF THE REGIONS FOR DEVELOPING COMMON RESEARCH LINES

Definition of a cooperation protocol among the research centres and the university partners of the clusters. Some of the research bodies (both universities and research centres) present in the four clusters represent also an excellence in the specific field of Urban Logistics or in technological and methodological fields closely related to it. Hence their cooperation on common matters could give an impulse to further development in the regions, providing experience and knowledge capable of triggering innovation through a closer relationship with the productive environment. This will contribute to the regional development of S3s too, namely with respect to resource-efficient technologies. Areas of intervention such as Urban Logistics performance, electromobility, sustainable regional development, automotive components, ICT systems may be explored.

OBSERVATORY ON URBAN LOGISTICS

The implementation of a web based Observatory on Urban Logistics technologies and good-practices it will be an important "database" (in the wide sense of the term, as it will use a multiplicity of tools and techniques) of knowledge regarding Urban Logistics.
It will be useful in updating the information about the most advanced solutions in the field and, thanks to the academic skills, also about basic technologies that could be applied in innovative Urban Logistics projects. The initiative will also be a concrete starting point of cooperation among universities and research centres within the framework of the aforementioned cooperation protocol. As a consequence the evaluation of deployment of innovative solutions and most adequate best-practices in this field will be also a valuable tool for stakeholders to assess their specific situations and decide on the most adequate way forward.
It should be noted that this Thematic Area is closely linked to others, and in particular with:

- Thematic Area 4, as the educational and training initiatives could be addressed by the outcomes of the observatory or by the outcomes of the cooperation among universities; and
- Thematic Area 3, especially concerning the cooperation with other clusters and European bodies.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Innovation and scientific cooperation		
6.1	A web based platform for supporting match making and cooperation among the Clusters for industrial cooperation and fund searching	Defining a platform for the management of information about the Clusters' members and allowing electronic match making and searches and other useful functions to support the future cooperation.
6.2	Cooperation protocol among the research centres and the universities of the Regions for developing common research lines	Definition of a cooperation protocol and identification of the main research lines. Definition of some specific actions to improve cooperation among research institutions and companies within the Clusters.

6.3	Set up of an international Observatory on UL technologies and practices	Definition of the objectives, structure, organization, players to be involved, eventual IT platforms etc. for setting up the observatory. Definition of the interfaces with other European or national networks, platforms and institutions in the field useful at this purpose.

Internationalisation of Clusters

The DOROTHY project highlights the importance of expanding the horizons of the project outputs beyond the European Union. A specific activity, whose objective is to foster the internationalisation of the regional clusters, has been carried out, and a set of actions to create the best conditions to set up a cooperation framework with non EU countries have been defined. This work represents the starting point for an internationalisation process that will last over time, taking advantage of the support that the regions offer to endorse it and the network of other companies in the regional clusters.
The internationalisation strategy has to be conceived over a medium-long term perspective and is an ambitious target, being very demanding in terms of economic resources and time. This effort is particularly heavy for SMEs that are the focus of the DOROTHY clusters.
In order to support this effort, a specific Thematic Area has been foreseen and a series of specific actions have been designed.
Due to the recent creation of the regional clusters and the complexity of the matter, the structures of cooperation and strategic internationalisation lines for the clusters, as a whole, are not yet clearly defined. The adopted strategy followed a “bottom-up” approach, in fact, the main driver for the definition of the target foreign markets has not been a theoretical analysis of the market potential, but a practical analysis of the network of international contacts and experiences existing among the clusters’ partners, interlinked with the appeal of the specific geographical area in terms of market potential, environment and existing barriers.
The chosen approach gives the possibility to start operating in an international perspective, but also in a short period of time and it creates a profitable framework to generate synergies for businesses inside the clusters in the near future.
The internationalisation strategy comprises three working lines devoted to **generate presence** (marketing and communication strategies addressed to non-EU market players), **knowledge transfer** (improve awareness about new products) and **investments**. According to this, some activities have been highlighted as the ones to be carried out during the project and some others strictly after Dorothy completion. It is important to note that a mix of different actions can be used in different situations, depending on the degree of maturity of the existing contacts.

A. Networking.
Organisation of meetings and bi-lateral events between companies in the sector (B2B, trade shows, conferences, etc.). This approach is ideal when the penetration in the local situation is quite mature and there is the possibility to interact with the local productive environment.

B. Training programmes.
Exporting know-how and general knowledge through universities and research centres is a good way of extending the links toward companies from a pure scientific perspective.

C. Partnership in R&D projects.
Introducing non-EU partners in research projects to exchange experience and improve the local situation is an opportunity for creating operational cooperation and for defining specific research programmes targeted at the development of new products for these markets.

D. Definition of commercial and productive agreements between companies for supplying products and/or services.
This is clearly the last link of the penetration chain and is the final target of the above mentioned activities.

These different kinds of activities have been used to set up three different actions.

REGIONAL CLUSTERS' CATALOGUE
The objective of this action is the realisation and promotion of the Regional Clusters' Catalogue, conceived for disseminating the knowledge both of the clusters in their completeness and of their single members, by describing the clusters' qualifications, skills, development lines and products.
The catalogue has an important role for:

- Disseminating the cluster concept in the field of Urban Logistics.
- Promoting the image of the cluster's members.
- Improving the possibilities to create partnerships (business, research and innovation, regional development, etc.).
- Supporting the internationalisation cooperation possibilities.

The catalogue presents the clusters in general and each member of the four clusters, with a detailed description of each entity (logo, contact address, domain, activity, products, etc.).
The Regional Cluster's Catalogue is another contribution to the consolidation of the idea of clusters and to the identification of the single partners themselves into their cluster. It supports a cultural change towards an attitude of cooperation, exchange of best practices and it hopefully will work as a cohesion tool.

TARGETED ACTION TOWARDS NON-EU COUNTRIES
This action is devoted to supporting directly the internationalisations of the DOROTHY clusters' companies and two different approaches have been used toward different countries.
The first is addressed to countries where already active relationships with some of the clusters' members exist. It considers a set of short term activities to strengthen this presence and enlarge it to other clusters' members, in a cooperation perspective. Based on the experience in non-EU markets of some regional clusters' companies, a first strategy to approach some significant market has been defined, with precise actions (events, training courses, potential partners, etc.). In one case the first steps have been already undertaken, i.e., the action toward Mexico was approached right according to this strategy.
The second kind of approach is focused on a potentially interesting situation where the existing contacts are academic or in any case weaker; in this case a more general strategy for enlarging the contacts' network has been adopted. This is the case of Colombia, Ukraine, Moldova and Angola.

COORDINATION WITH ALREADY PLANNED REGIONAL INITIATIVES
This action is aimed at including the DOROTHY clusters in the general programmes of internationalisation that the regional institutional bodies carry out for the benefit of their productive (industrial and commercial) subjects.

This approach has already led to some significant results and will constitute a short-term catalyst for aggregating other companies around this initiative, identifying common goals between the regional clusters and creating a favourable environment for the companies so to address new markets.

ACTION FIELDS	Related actions	Objective of the Dorothy action
Custers' internationalisation		
7.1	Regional Clusters' catalogue.	Implementation of a catalogue for disseminating and promoting the Clusters' qualifications and products, etc. Implementation of a brochure with a detailed description of each company involved in the cluster (activity, products, contacts, etc.).
7.2	Targeted actions toward non-EU countries	Organization of a series of events to support the internationalization of the Clusters.
7.3	Coordination with already planned Regional initiatives	Evaluating the possibility of including the Dorothy Clusters in some initiatives already planned for the internationalization of companies by the Regions or by local Chambers of Commerce.

The start up of the implementation of the JAP actions

The last period of the Project was devoted to the start up of the different actions foreseen by the JAP, according to a specific short-term period implementation plan of activities to be carried out during the Project itself.

These activities were of course preliminary to the real full implementation of the JAP actions, which will follow the foreseen plan and were mainly targeted to create the best condition for their development after the Project termination. Nonetheless, the results obtained in this last final phase of DOROTHY Project are very important, as they can ensure continuity to some of the actions and to the European cooperation set up within the Project framework.

For each one of the actions a responsible among the DOROTHY partners has been defined and specific cooperation with other DOROTHY partners or Clusters' members have been activated.

In the present paragraph these activities will be shortly described action by action.

THEMATIC AREAS / Related actions	Work carried out within the Dorothy framework
Regulations and policies	
1.1 Sustainable Urban Logistics Plan	The four Dorothy Region partners (according to the allocated responsibility) on behalf of the Clusters have activated contacts with the Regional body responsible for Mobility for evaluating the strategy about SUMP/SULP and discussing possible incentives to cities for the adoption of SULP. The main topic was the use of Structural funds or other regional funds for stimulate and support the development of SULPs by the cities. The meetings have been prepared through the specific documentation.
1.2 UL policies, regulations and supporting technologies	The structure of a future publication about UL regulation schemes and the related technologies (table of contents, writers, etc.) has been prepared. A research about suitable material produced by other European Projects and other sources has been carried out and a directory of the available publications about the same themes has been created. An evaluation has been performed about the possibility to produce a first publication containing a significant set of UL regulation schemes and the related technologies to be distributed among cities in the Regions.
Standardization and monitoring	
2.1 Urban logistics performance index.	The team for the development of the work has been defined. The first analytical steps of the work have been already carried out under the coordination of the action responsible partner. In particular questionnaires have been compiled and filled by a set of partners and a first draft of the work to be carried out has been defined. A methodological approach has been also discussed among the interested partners and is under refinement. The possibility of carrying out a pilot experience in some city has been evaluated and the first version of the survey, in order to define a baseline for the potential cities involved in the pilot, have been submitted to CCPs and all the relevant partners (cities/metropolitan cities) directly or indirectly involved into the project. The possibilities of funding sources and programs have been scouted.
2.2 Availability of Open data for urban logistics	The action has been the subject of a specific workshop during the Tuscany Road show for the presentation of the JAP. The theme has been debated with the Regional Information System Department in charge of open data architecture and the interest by other stakeholders has been collected. The work about this action is carried on in close relation with the one foreseen by action 3.2; the idea is to start the development with a limited demonstrator showing the opportunities offered by the availability of Open Data for enabling new services. Initial contacts with some cities in the Valencia Community and the Lisbon and Tago Valley Region have been activated for discussing the program.

2.3 Regional UL accreditation system	A check about the interest of UL operators has been carried out in some of the Regions resulting in a very high degree of interest. A team of technology provider companies capable and interested in developing the application/product has been created. The idea is to develop a Proof of Concept in an available city and specific contacts have been activated.
Regional Clusters' development	
3.1 Innovative ICT solutions to support advanced UL regulation schemes	The team for the development of the new platform starting from the existing products started cooperating. A proposal for the installation of a parking monitoring system in Lisbon has been prepared and submitted to the City. The theme will be the subject of a proposal to be submitted in one of the next calls for European Projects.
3.2 Open data architectures to support urban logistics	The work on this action has been carried out by a team of companies and research institutes by Italy, Spain and Portugal in close relation with the work carried out for actions 2.2 and 2.3. A pilot project for a demonstrator has been prepared and submitted to a couple of cities in the Valencia Community and in Lisbon. In Tuscany the matter was the subject of a specific workshop as detailed for action 2.2.
3.3 Proximity delivery areas	The action has been the subject of a specific workshop during the Tuscany Road show for the presentation of the JAP. During this event the interested stakeholders to be involved in the pilot (logistics operators, administrators of logistics platforms, cities officers, technology developers and researchers) have been selected to define a task force that, starting also from past specific experiences about special cargo units for urban delivery, can quickly implement PDA solution in the main Tuscan cities, The possibility to prepare a proposal for the development of a specific application on further EU funding is under evaluation. In Spain a proposal for the set-up of a proximity delivery area in the city centre of Valencia has been prepared and submitted to the Regional Authority for achieving funds. The foreseen scheme comprises also a cargo bike service for the delivery by the PDA to shops in the central area.
3.4 Cooperation agreement among the Dorothy Clusters	The cooperation agreement among the Clusters have been defined and already signed during the main clusters event held in Valencia during October 2015.
3.5 Cooperation with other existing Clusters and networks	Contacts have been taken with the main European initiative about Clusters and Urban Logistics networks . The most important and fruitful contact was with the Alice Platform where the partners can play the role of the “European node” on urban logistics.

Training and education	
4.1 High level international master degree in Urban Logistics	A team of DOROTHY academic partners have already developed a draft of the first edition of the International Master in Urban Logistics that would be led by the University of Valencia. Contacts are going on and the work is in progress.
4.2 Staff training for personnel on new UL schemes and techniques	At the moment no specific further activity has been carried out.
Urban Organisation	
5.1 Supporting the use of "Cargo bike" for delivery in urban centres	As mentioned for action 3.3, a proposal for the set-up of a specific cargo bike service for the centre of Valencia has been submitted to the Valencia Regional Authorities for obtaining a grant. In Lisbon a feasibility study to set up a cargo bike service for the city of Almada (DOROTHY partner) has been developed and is now under evaluation for its implementation.
5.2 Organizing a network of operators in the cities for implementing proximity delivery points for parcels	The action has been the subject of a specific workshop during the Tuscany Road show for the presentation of the JAP. Until now the theme has been subject of debate in some meetings with professional associations of logistics operators and the Tuscany Region for evaluating the opportunity to start a design process for the adoption of a similar scheme in Tuscany.
Innovation and scientific cooperation	
6.1 A web based platform for supporting match making and cooperation among the Clusters for industrial cooperation and fund searching	The technical requirements for the platform have been defined and specific products satisfying the needs have been identified. The Project Coordinator has acquired a commercial offer for a first set up of the platform.
6.2 Cooperation protocol among the research centres and the universities of the Regions for developing common research lines	A draft of the cooperation agreement among all the Universities and research centres involved in DOROTHY has been prepared, discussed and finalized. The document is ongoing through the bureaucratic processes of the different Universities for the approval.

6.3 Set up of an international Observatory on UL technologies and practices	No specific activity at the moment.
Clusters' internationalisation	
7.1 Regional Clusters' catalogue.	A first version of the catalogue has been already produced and is available in electronic and printable format. It has been already used in some events and is available to all the Clusters' members.
7.2 Targeted actions toward non-EU countries	The most important activity carried out was the mission to Mexico performed by a representative of the DOROTHY Project on June 2016. For the purpose a specific training course organised by the MOVUS (one of the DOROTHY partner) in cooperation with the Veracruz University was held by some professionals of the DOROTHY team. Formal contacts have been taken also with the City of Veracruz and other Mexican companies. Cooperation opportunities have been discussed and a first occasion of joint development of an Urban Logistics Plan for the City of Veracruz between some DOROTHY partners and the University has been discussed and is currently under development. A specific visit in Ukraine by IPA, a Romanian DOROTHY partner has been carried out for presenting the DOROTHY experience and the Clusters in academic and industrial environment and to discuss possible technological transfer. See the next paragraph for a detailed description.
7.3 Coordination with already planned Regional initiatives	Specific local meetings with Bodies responsible for the regional commercial promotion have been carried out in some of the Regions for presenting the Clusters and the DOROTHY experience. The partners, however, are monitoring the situation in each region concerning new opportunities to cooperate with.

The internationalisation of the Clusters

One of the achievements reached by project Dorothy has been in the field of the internationalization of the Clusters. During the Project, as previously described, a limited set of countries, targets for the Project internationalisation activities, have been identified according to the aforementioned methodology.

The most important of these countries was, for several reasons, Mexico.

During the last phase of the project, a specific mission to Mexico has been organised, following a strategy defined during all the Project and started with a first trip to this country in 2014. The organisation of this mission took profit from a network of existing contacts and relationships at academic and industrial levels, mainly by the Spanish partner MOVUS. The location of the first official mission was Veracruz, an important city on the eastern Mexican coast and the most important harbour of the Caribbean area. The city is undergoing to a huge development due to the expansion (5 times the current dimension) and repositioning of its port and is particularly interested in the matter of logistics.

The targets of the mission were:

- To consolidate the contacts and to widen them to other DOROTHY and Clusters' partners
- To gain reputation in the Mexican environment as point of excellence for Logistics
- To discuss with the City Authorities about possible joint initiatives and projects
- To find potential local partners to start some cooperation initiatives.

For achieving all these targets different events and meetings have been organized.

- An academic training course called "City and Urban Logistics" was organized with and held in the University of Veracruz. More than 40 people, among which academic professors, professionals and public servants, attended it; the lectures were held by professionals of the Dorothy team. It was an occasion to exchange knowledge and opinions and to better understand the reality of Mexico and in particular of Veracruz.

CURSO DE FORMACIÓN: CIUDAD Y LOGÍSTICA URBANA

20-22 JUNIO 2016. Veracruz (México)

I CONGRESO INTERNACIONAL DE LOGÍSTICA URBANA

23-24 JUNIO 2016. Veracruz (México)

El I CONGRESO INTERNACIONAL DE LOGÍSTICA URBANA se celebrará del 20 al 24 de Junio de 2016 en Veracruz (México) y representará una oportunidad clave para discutir proyectos, políticas y estrategias de logística urbana en el desarrollo de las ciudades y las economías locales.

El Congreso se ha organizado en forma de semana temática sobre la logística urbana, aunando actividades de formación con actividades dirigidas a crear vínculos entre empresas y entidades del sector.

AGENDA

CURSO DE FORMACIÓN: CIUDAD Y LOGÍSTICA URBANA

Universidad Veracruzana

SESIÓN 1: 20/06/2016

Introducción a la logística urbana		
16:00 - 16:15	Registro de participantes y entrega de documentación	
16:15 - 16:30	Bienvenida e introducción al curso	Ing.Juan Bueno, MOVUS Dra. Sara D. Ladrón de Guevara, Rectora de la Universidad Veracruzana
16:30 - 17:30	La Ciudad: Planeamiento urbanístico y nuevas necesidades de movilidad y transporte de mercancías.	M.C. Elsa Gpe. Lagunes Lagunes. Facultad de Ingeniería Civil, UV
17:30 - 18:00	Pausa café	
18:00 - 19:15	Conceptos básicos de Movilidad Urbana Sostenible y el contexto estratégico de la logística urbana	Universidad de Veracruzana
19:15 - 20:30	Veracruz: Presente y Futuro	Arq. José Manuel Ruiz Falcón, Director del Centro Histórico, Ayto. de Veracruz

SESIÓN 2: 21/06/2016

Herramientas de gestión y potencial de innovación en la logística urbana		
16:00 - 17:00	Análisis, planificación analítica y gestión de la movilidad urbana y de las mercancías.	Dr. Ing. Tomas Valenteni. TSS, Redas (España - Italia).
17:00 - 18:00	Tecnologías aplicadas a los sistemas de Gestión de Movilidad	Ing. Maroo Mastretta, T3 English
18:00 - 18:30	Pausa café	
18:30 - 19:30	ITC para la logística urbana	Ing. Andrea Giacoherini. Aleph (Italia). English.
19:30 - 20:15	La visión del puerto de Veracruz sobre la logística urbana	Arq. Francisco Liaño Carrera. APIVER
20:15 - 20:45	Soluciones para el transporte de paquetería en ámbito urbano	Gabriela Torres,FEDEX

SESIÓN 3: 22/06/2016

El proyecto Dorothy: un ejemplo de innovación y herramienta de desarrollo		
16:00 - 16:30	Problemas y Oportunidades de la logística urbana. Regulación y mejora del proceso de distribución urbana	Ing. Maroo Mastretta / Luigi Sardi, T3 (Italia). English.
16:30 - 17:00	Technological solution to develop an urban logistic platform	Ing. Luigi Costalli. Aleph (Italia). English.
17:00 - 17:30	Pausa café	
17:30 - 18:15	Joint Action Plan: Cooperación en I+D	Ing. Gabriel Vladut, IPA Craiova (Rumania). English.
18:15 - 19:00	Joint Action Plan: Organización urbana. Instrumentos de planificación.	Ing. Mauro Fiore/Ing.Isabel Espinós, Movus (Valencia - España)
19:00 - 20:00	Joint Action Plan: Innovación y cooperación científica	Dr. Ing. Tomas Valentini. TSS, Redas (España - Italia).
20:00	Clausura del curso	

I CONGRESO INTERNACIONAL DE LOGÍSTICA URBANA

Auditorio del Museo de la Ciudad

23/06/2016		
8:30 - 9:00	Registro de los participantes	
9:00 - 9:45	Bienvenida y presentación del Congreso	C. Ramón Poo Gil, Presidente Municipal del Ayuntamiento de Veracruz Arq. José Manuel Ruiz Falcón, Director del Centro Histórico, Ayto. de Veracruz Dr. Alfonso Gerardo Pérez Morales. Vicerrector de la Región Veracruz. Dr. Carlos Lamothe Zavaleta. Secretario Académico de la Región Veracruz. Mtro. Agustín Miguel Flores Fuentes. Director de la Facultad de Ingeniería. Dra. Miriam Remess Pérez. Coordinadora de la Carrera de Arquitectura y Coordinadora del Grupo de Colaboración Académica 'Habitabilidad y Tecnología Sustentable'. Dr. Ing.Mauro Fiore/Ing.Isabel Espinós, MOVUS
9:45 - 10:30	Introducción al Joint Action Plan y los Clústeres de logística urbana del proyecto Dorothy. El roll de la UE en la investigación y la cooperación internacional.	Ing. Maroo Mastretta, T3 (Italia) Ing. Gabriel Vladut, IPA Craiova (Rumania)
10:30 - 11:00	Pausa café	

11:00 - 13:00	Mesa redonda: la ciudad y la logística. Políticas y proyectos de futuro.	*Moderadores: Marco Mastretta(Italia),Mauro Fiore(España), Joao Cleto(Portugal)* C. Ramón Poo Gil, Presidente Municipal del Ayuntamiento de Veracruz Arq. José Manuel Ruiz Falcón, Director del Centro Histórico, Ayto. de Veracruz Arq. Isabel Espinosa Segura, Presidenta de la Federación Nacional de Colegios de Arquitectos de la República Mexicana Pablo Francisco Miquel Aguilar González, presidente del Colegio Nacional de Jurisprudencia Urbana Ing. Dario Tapia, Cuidad de Quito (Colombia) Arq. José Luis Cortes Delgado,Ex Presidente del Colegio de Arquitectos de la ciudad de México
13:00 - 14:00	Exposición: Casos destacados de ciudades mexicanas. Ciudades y Transportes. Ciudades Mexicanas *Movilidad Urbana (Caso Área Metropolitana de Monterrey)*	*Moderador: Mauro Flore/ Juan Bueno* Adriana Lobo, Directora ejecutiva CTSEMBARQ M.C. Elizabeth Garza Martínez
14:00 - 15:30	Pausa comida	

15:30 - 16:30	*Movilidad Urbana (Caso Cancún)* *Plan Maestro de Movilidad Sustentable de Mérida*	Arq. Andrés Aguilar ,Director General IMPLAN Cancún Edgardo Bolio, Director General IMPLAN Ciudad de Mérida
16:30 - 18:00	**Planificación de la Logística Urbana** *Planificación analítica y sistemas de modelización* *El SULP de Almada(Portugal)Creación de una plataforma web de apoyo a la gestión del cargo -bike en Almada*	Universidad Veracruzana Dr.Ing.Thomas Valenteni Ing. João Cleto, AGENEAL (Portugal)
18:00 - 19:00	**Soluciones tecnológicas aplicadas** *La plataforma integrada de movilidad en la ciudad de Bogotá*	Ing. Andrea Giacoherini. Aleph (Italia) Ing. Diego Martínez, SKG (Colombia)
19:00	Clausura	

24/06/2016	
9:00 - 12:00	Reuniones bilaterales y exposición de stands
12:00 - 14:00	Visita guiada por la ciudad de Veracruz

- The first International Conference in Mexico about Urban Logistics organised by DOROTHY in cooperation with the Municipality and the University of Veracruz. It was a high level event with speech by representatives of policy and decision makers of the City, representatives from the Professional Orders of Architects and of Engineers, urban planners, etc. The DOROTHY Project had a large part with two specific presentations about the JAP and about the opportunities for cooperation between European and Mexican partners.
- A B2B meeting with Mexican companies held at the end of the mission.

The outcomes of the mission were really satisfying as the events were really successful with a numerous and qualified participation. Several meeting occurred with academic and business potential partners.

As a sign of the appreciation by the new acquired Mexican partners, a special ceremony was organized and held by the City of Veracruz in the City Hall with the presence of the Lord Mayor, of all the City Government, of the local press and of the public. The Mayor officially appointed all the DOROTHY representatives with the honorific title of “Visitante Distinguido” (Distinguish Visitor), a title foreseen by the City for particular visitors.

To the mission participated representatives from all the DOROTHY Regions

The events were widely reported on the local press too.

Visitantes Distinguidos a Asistentes al Congreso de Logística Urbana

Realiz Cabildo porteño sesión solemne

EL DICTAMEN / VERACRUZ, VER.

La Sesión Solemne de Cabildo el Honorable Cuerpo Edilicio nombró como Visitantes Distinguidos a los participantes del "Primer Congreso Internacional de Logística Urbana" que se llevó a cabo del 20 al 24 de junio en la ciudad; ceremonia en la que el Presidente Municipal, Ramón Poo Gil, destacó la realización del evento como un espacio de diálogo y promoción de proyectos, políticas y estrategias de logística urbana en el desarrollo de las ciudades, con el fin de impulsar las economías locales.

"Es un gusto y un honor que nuestra ciudad sea sede de un evento de esta talla, con prestigiados ponentes de Italia, España, Portugal y Rumania, para establecer líneas de trabajo con la finalidad de mejorar la distribución urbana de mercancías, potenciando la relación entre las entidades y detonando el desarrollo"; manifestó Ramón Poo, durante la sesión Solemne en la que también los visitantes al congreso le entregaron un reconocimiento.

De igual manera, el Primer Edil indicó que en el municipio se está asegurando el desarrollo urbano sustentable de la ciudad mediante la creación e implementación del Reglamento de Desarrollo Urbano, Fraccionamiento y Vivienda; además de ser el primer municipio de México en emprender el Programa de Desarrollo Bajo en Carbono del Banco Mundial.

Asimismo dijo que se está incorporando la movilidad urbana sostenible, soluciones tecnológicas aplicadas a la logística urbana y la planeación urbana como tal; todas estas acciones encaminadas a convertir Veracruz en una de las primeras Smart Social Cities del país.

Durante la ceremonia fueron nombrados como Visitantes Distinguidos a la responsable del departamento de proyectos de la empresa Movilidad Urbana Sostenible S.L., Isabel Espinos García; el Director del Proyecto "Dorothy", Marco Mastretta; así como los asistentes al congreso Rafael Torres, Tomás Valentini, Rita Bustamante, Luigi Costalli, Joao Cleto, Mauro Fiore, Maico Mastrea, Alberto Martínez, Gabriel Vladut, Marilena Boghearua, Marilena Capatina, Georgiana Baiasu, Dana Ilie, Iliana Maria y Miriam Remes.

Estuvieron presentes, el Capitán de Navío de Infantería de Marina, Luis Enrique Barrios Ríos; el Síndico Único, Carlos José Díaz Cornales; la Regidora Cuarta con la comisión de Sesiones Solemnes, Laura del Carmen Gálvez Mantilla; el Regidor Primero, Pablo Zurita García; la Regidora Segunda, Ángela María Perera Gutiérrez; el Regidor Tercero, Ángel Maldonado Rodríguez; el Regidor Quinto, Víctor Hugo Vázquez Botello; la Regidora Séptima, Yadira Carrillo Marín; la Regidora Décima, Delta Estela Tiburcio Hernández; y el Regidor Décimo Primero, Juan Gabriel Montes de Oca López.

Diputado Ricardo Ahued

As a result of the Mexican mission, a first cooperation between some Italian and Spanish Clusters' members and the University of Veracruz is under development with the purpose of defining a logistics plan for the City.

Other international activities have been carried out in Moldova and Ukraine.

In Moldova ARoTT, member of the Dorothy Consortium has established contacts with the Moldovan Technology Transfer Network (MTTN) (www.rttm.md).
MTTN has the role to apply and commercialize the scientific results, increasing the level of usage of human and material resources from Universities and R&D centres, to sustain the creation of innovative SMEs and to create and develop the partnership between scientific and business potentials.
ARoTT has presented the Dorothy Clusters and experience during a Conferences in Moldova and encountered the interest by the Moldovan partners to develop a new cluster in urban logistics.

In Ukraine, IPA (Romania) as partner of the DOROTHY Consortium, has taken part in a bilateral event with the Technology Transfer Centre NTUUKPI in Kyiv, Ukraine.

The objective of the event was the analysis of the possibility to exchange technologies and experiences and focusing on possible cooperation opportunities. The DOROTHY Projects was presented and debated.
The possibility to set up cooperation between the DOROTHY partnership and the NoGAP Project was analysed. NoGAP aims at promoting the cooperation of the EU and its Members States/Associated Countries with the Eastern Partnership Countries (namely: Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine) on bridging the gap between research and innovation. In all these countries, there is a strong interest to know more about Clusters and their benefits, management and experiences and a strong interest to foster cooperation.

3. FINAL RESULTS AND THEIR POTENTIAL IMPACTS AND USE

The main results of the project can be mainly summarized as:

- The set up of the Regional Clusters on Urban Logistics in the partner regions and the start up of their operational activities
- The production of the Joint Action Plan for the Clusters and the Regions. Containing a set of actions to be implemented in the next future, after the project termination.

It's quite evident that the target of the project was to prepare the conditions for specific future activities in the field of Urban Logistics, identifying/validating the Clusters as the main tool for carrying out these actions.
As a further result of the project it can also be mentioned the start up of a cooperation among the Clusters in respect to some of the actions included in the JAP.

Regarding the potential impacts of the project and its results, it is necessary to distinguish among different levels:

- The level of the project itself, that is the impact and the use of the results directly generated and illustrated in the preceding chapter.
- The level of the single actions included in the JAP, whose impact can be different. The impact of each single action has been analysed and a summary of the outcomes has been

reported in the JAP, action by action. Moreover it is possible to affirm that the impact analysis has been one of the drivers for the selection of the actions to be included in the JAP.

- The impact analysis has been carried out according to four different dimensions:
    - Social impact
    - Economic impact
    - Urban impact
    - Environmental impact.

- The level of the JAP as a whole, that is the impact that the implementation of the JAP, as an integrated set of measures, could have on the project territories.

At a project level the constitution of the Clusters is an usable result, whose impact can be different according to the capacity the Clusters themselves will have in developing the initiatives foreseen by the JAP. Anyway a first impact already occurred since in the four Dorothy regions there is now a Cluster of companies, research institutes/universities and public administrations, that actively started their cooperation. This happening represents by itself an important improvement with respect to the situation existing before the project starting, as the level of exchange between companies and other institutions was low in all the regions.
The huge performed dissemination and the actual stakeholders involvement created great expectations, which can foster the development of the Clusters.
The recorded impacts at this level can be shortly summarized as it follows:

- A growth in the attention by public bodies (regions and municipalities) to the matter of urban logistics, thanks to the action of the project and of the clusters.
- The establishment of a “permanent” table for the discussion of the urban logistics problems within the region.
- The first attempt to build up joint projects to access funding to develop some of the JAP actions.

The Clusters can represent a very important chance for the regions and the companies belonging to the latter, in order to develop the economic tissue and create a specialized niche of companies that can operate at a European and international level, by means of specialised and innovative products.
Specifically, a very important potential impact, whose bases have been generated by the Dorothy project, resides in a stronger and closer cooperation between Universities and Companies and it could really lead to a strengthening of the innovation capacity of the industrial system in the reference sector and widening of the field of interest of academic institutions.
Finally the Clusters can also have a beneficial effect in the use of Structural and Cohesion Funds, addressing the next ROPs and the specific initiatives within the ROPs, toward promising development lines.
At the action level, each singe action can have very different potential impacts, according to their nature and characteristics, which have been reported in the JAP document; in the present report it is impossible of course to go through the whole analysis. However it is relevant to remind that the potential effects are wide and ranges from the improvement of the economic situation of the companies of the regions, to the improvement of livability in the cities, to a better organization of the goods delivery process in cities resulting in lower costs, finally up to a higher level of expertise in companies and universities about the topics of urban logistics. The following table summarize in qualitative terms up the main expected impacts at an action level, leaving to the JAP the details.

THEMATIC AREAS / Related actions	Expected impacts
Regulations and policies	
1.1 Sustainable Urban Logistics Plan	The creation of a suitable environment in the cities for the adoption of more advanced regulation schemes reflecting in a higher and more qualified demand for specialised equipment for urban logistics management. Better understanding by city administrations of the needs of urban logistics and better qualification of the personnel. Potential direct market for the engineering companies belonging to the Clusters
1.2 UL policies, regulations and supporting technologies	Increasing the awareness by the public administrations about innovative solutions for urban logistics. Improving the quality of the decision making process. Creating a link between public administrations and companies on the specific topic.
Standardization and monitoring	
2.1 Urban logistics performance index.	Improving the capacity of the engineering companies of communicating to policy makers the diagnosis of urban logistics for planning. Easing and addressing the policy makers decision making process.
2.2 Availability of Open data for urban logistics	Opening a market for third parties applications based on availability of open data foe urban logistics. Economic development of SMEs working on app for the specific sector Improvement of the working conditions for urban logistics operators with an easier access to data. Possible limited increase in occupation.
2.3 Regional UL accreditation system	Savings for urban logistics operators in carrying out all the operations related to permissions release by the cities. Better management of the pe4rmissions release process by the municipalities and savings in time and money. Development of a general purpose product that can be commercialised all over Europe and outside it. Additional revenues for the developers. Possible increase in occupation

Regional Clusters' development	
3.1 Innovative ICT solutions to support advanced UL regulation schemes	Availability of a family of industrial innovative products with a wide potential market. Economic development and increase of occupation. Better competitiveness by the products developers on this specific market. Possibility by the cities to adopt more efficient urban logistics regulation schemes thanks to the availability of these products. Improvement of the urban logistics process due to the adoption of more efficient regulation schemes.
3.2 Open data architectures to support urban logistics	Availability of an industrial innovative product than can be the basis for further developments. Economic development and increase of occupation. Possibility by the cities to adopt more efficient urban logistics regulation schemes thanks to the availability of these products. Improvement of the urban logistics process due to the adoption of more efficient regulation schemes.
3.3 Proximity delivery areas	Availability of a family of industrial innovative products with a wide potential market. Economic development and increase of occupation. Better competitiveness by the products developers on this specific market. Availability for the cities, especially the ones with old historical centres, to adopt new efficient solutions for the delivery of goods in B2B schemes. Important savings by the urban logistics operators due to the adoption of this kind of solutions. Lower interferences between the goods distribution process and the daily life of cities. Environmental benefits for the lower driven mileage.
3.4 Cooperation agreement among the Dorothy Clusters	Strengthening the cooperation among the Dorothy Clusters companies. Creating the conditions for a long lasting cooperation and for the development of new initiatives.
3.5 Cooperation with other existing Clusters and networks	Inclusion of the Dorothy Clusters in the European networks of Clusters and other organisations. Easing the access to funds for supporting innovation. Fostering the innovation process through the dialogue with more advanced realities. Better qualification of the Clusters companies.

Training and education	
4.1 High level international master degree in Urban Logistics	Improvement of the overall qualification of the territory in the matter of urban logistics. Specialisation of the territory and attraction toward students interested to the matter. Long term growth of excellence centres in the regions in the specific matter.
4.2 Staff training for personnel on new UL schemes and techniques	Improvement of the skills of the personnel of the Clusters companies. Fostering innovation through a continuous high level training on advanced topics and innovative solutions. Creation of business opportunities for companies in the regions operating on professional training.
Urban Organisation	
5.1 Supporting the use of “Cargo bike” for delivery in urban centres	Improvement of the good distribution process for the last mile. Creation/enlargement of specialised companies with possible additional occupation. Economic improvement for companies Availability for the cities of an efficient solution for distributing goods in valuable areas with a low interference with pedestrians and other functions. Environmental benefits due to lower emissions.
5.2 Organizing a network of operators in the cities for implementing proximity delivery points for parcels	Innovative solutions available for the cities for organising the distribution in particular areas. Possible development of a general purpose ICT product for the management of this particular organisational solution. Economic development for the developers and possible incremental occupation. Additional business for traditional specific commercial operators categories working in cities. Savings for urban logistics operators due to the limitation of the delivery operations Environmental benefits.
Innovation and scientific cooperation	
6.1 A web based platform for supporting match making and cooperation among the Clusters for industrial cooperation and fund searching	Better interaction among the Clusters and their companies. Fostering innovative ideas through the exchange with peers and the search for complementary skills. Easing the access to funds for granting innovation.

6.2 Cooperation protocol among the research centres and the universities of the Regions for developing common research lines	A better environment for research and innovation in the regions. An incentive for the regional universities to work on urban logistics.
6.3 Set up of an international Observatory on UL technologies and practices	Creation of the conditions fro companies and universities to access easily to the state of the art of knowledge and applications in the field of urban logistics.
Clusters' internationalisation	
7.1 Regional Clusters' catalogue.	A simple additional tools for the commercial actions of the companies belonging to the Clusters
7.2 Targeted actions toward non-EU countries	Expansion of the business of the Dorothy Clusters in non-EU countries. Additional revenues and positioning on interesting developing markets. Creation of local business units in cooperation with local players. Possible creation of specific products/services for the local realities.
7.3 Coordination with already planned Regional initiatives	Inclusion of the Dorothy Clusters in the circuit of the institutions working for supporting the economic development of local companies on external markets.

Considering also the implementation of the JAP as a whole, the impacts can be enhanced by the interaction/interconnection between the different actions, so that the combined effect can be significantly stronger and higher than the simple sum of the single effects. Taking into consideration the usual four dimensions of our impact evaluation, the effects can be summarized as it follows.

Economic impact

According to a prudential forecast, the full implementation of the JAP could generate for the Clusters companies a potential additional turnover, over a time period of 7 years, around 87 m€, with an investment for the implementation of 8.5 m€.

Apart from this direct economic development effect on the regional industrial structure, it is also mentionable a set of indirect effects that are hard to quantify, but can be listed and described as it follows:

- Stimulation of the development of innovative applications and services by ICT companies, scientific community and developers, also leading indirectly to an important cost saving for public authorities and logistics operators, beneficiaries of applications, services and solutions developed by third parties.
- Overall optimization of the Urban Logistics from the point of view of public authorities, transport service providers, final users of these services and citizens.
- Increase in efficiency of logistic services within the urban area, due to (not exhaustively):
    - Better planning at a general level, due to all the information about regulations (i.e. windows time accessibility) and/or network characteristics (one way roads, reserved lanes, etc.).
    - Better planning of vehicle routes due to available information and continuous optimization in real time, due to the timely provision (and availability) of data.
    - Reduction of loss time (this means also average delivery time) due to the availability of information in real time about congestion affecting all routes, possible critical issues occurring unexpectedly in the overall network, parking bays availability and occupancy.
- Clear improvement of the overall mobility system and “eco-system” deriving from (not exhaustively):
    - Reduction of the number of commercial vehicles in service and of their routes length and travel time, consequently producing less pollutants and/or noise emissions.
    - Reduction of congestion, bottlenecks, unexpected events affecting efficiency of logistic services in urban areas and of possible indirect critical issues (i.e. risk of accidents), due to the availability of information to all stakeholders, the continuous update of these data sets and the real time monitoring of all relevant parameters and variables (traffic flows, congestion, accidents, etc.).

All these benefits could contribute to:

- For public authorities:
    - Direct benefits such as cost savings, being beneficiaries of solutions developed by third parties, which can be used for other relevant interventions, even focused on mobility (i.e. implementation of sensors to collect more data); more cost savings, due to the use of standard, well documented formats and protocols; easier procedures to detect and enforce illegal behaviors.
    - Indirect benefits: improvement in the efficiency of those processes affecting (also) mobility in urban areas, e.g. planning road maintenance / works, spatial and urban planning, services to citizens.
- For transport service providers: cost savings as a result of being beneficiaries of solutions developed by third parties, increased efficiency due to reduction of delivery time, and of fuel consumption due to the availability of all information to optimize deliveries (network

characteristics and regulation, real time traffic conditions, parking bays availability and occupancy, proximity delivery areas, etc.).
- For citizens: availability and usability of ICT applications developed by third parties and, as an indirect benefit of the overall system, reduction of congestion, noise and pollution.

Environmental impact
The effects of the JAP implementation on the environment are linked to the improvement of the urban logistics process and in particular to the following aspects:

- availability of data which can optimize the distribution process (permissions deliveries, availability of loading/unloading spaces, route optimization according to traffic conditions, etc.)
- adoption by cities of regulation schemes more sophisticated and smart, that can significantly reduce the delivery time. It's the case of proximity delivery areas in their different forms, smart access regulation schemes, possibility to reserve loading/unloading bays, etc.

All these improvements bring a reduction of driven mileage for the goods distribution operations, and consequently in a reduction of pollutant and noise emissions. Of course an exact quantification can be done only in the application framework (city, scheme adopted, volume and modes for deliveries, vehicles used, etc.).

Social impact:
This kind of impact is mainly linked to the following aspects:

- Occupation: taking into consideration only the additional revenues for the Clusters arising from the JAP implementation, the additional jobs estimation is at least of 120. The profile of the new jobs is the one of skilled personnel mainly operating in the ICT field.
- The creation of centers of competence on urban logistics, not only at industrial level, but also at academic level, can be attractive for skilled professionals, young people and students
- The adoption of innovative regulation schemes can have a beneficial impact on the organization of retail, giving the possibility to have opening hours close to the needs of customers rather than logistics operators'.
- Some of the actions foreseen by the JAP have also impact on the urban logistics operators organization process. E.g., in some countries and situations, the last mile operations are often carried out by independent small operators contractually linked to the large logistics operators. All the organizational modifications that could reduce the weight of the last mile have unavoidably the effect of reducing the need for work in this segment. An accurate analysis of the effects of these measures, in the specific application environment, must be carried out when implementing the actions, trying to limit this kind of impact.
- The adoption by cities of some of the JAP action can raise opposition by some stakeholders. The process for designing and implementing the measure must be carefully driven by policy makers, with the participation of all the stakeholders in the decision making process right from its early stages.

Urban impact:
The improvement of the goods distribution process can have a very important impact especially in those cities characterized by large historical areas. In these cases, often the difficulties in supplying commercial activities lead to the transfer of some kind of commercial activities in other areas, leading to a progressive impoverishment of the interested areas. Among the different measures that can be taken to counteract this trend, the application of schemes and techniques that ease the supply of goods in these areas, can give a very important contribution. The Dorothy JAP paid a particular attention to this specific topic, given the nature of the cities belonging to the partner

regions that are ancient cities with important historical centers. The focus of several Dorothy JAP actions is represented by the central areas of cities, with a high number of commercial activities and valuable architectural areas and an old street system. The driver of all the actions is to find a viable trade-off between the need of supplying so densely populated and difficult areas and the target to free them from cars and let space to pedestrians and leisure activities.
The application of these actions can therefore contribute to a better use of the urban space.

4. LIST OF PARTNERS

Participant organization name	Country	Participant short name	Type
Fondazione per la Ricerca e l'Innovazione	Italy	FRI	C
Regione Toscana	Italy	RT	A
Istituto Valenciano de Competitividad Empresarial	Spain	IVACE	AG
CCDR LVT Comissão de Coordenação e Desenvolvimento Regional de Lisboa e Vale do Tejo	Portugal	CCDRLVT	AG
Agentia Regionala de Dezvoltare Sud-Vest "Oltenia"	Romania	RDAO	AG
Comune di Firenze	Italy	CDF	A
Consiliul Local Municipal, Primaria Municipiului Craiova	Romania	LCM	A
Ayuntamiento de Castellon	Spain	MCA	A
Universidad Politècnica de Valencia	Spain	UPV	U
IST – Instituto Superior Técnico (Universidade Lisboa)	Portugal	IST	U
Universitatea din Craiova	Romania	UCV	U
Instituto Pedro Nunes (IPN) - Associação para a Inovação e Desenvolvimento em Ciência e Tecnologia	Portugal	IPN	R
SC IPA SA - Societate comerciala pentru cercetare, proiectare si productie de echipamente si instalatii de automatizare	Romania	IPA	R
Compañía de Almacenaje y Distribuciones Especiales S.L	Spain	CADE	E
AGENEAL – Agência Municipal de Energia de Almada	Portugal	AGENEAL	AG
Metro s.r.l.	Italy	MET	E
Asociatia Romana pentru Transfer Tehnologic si Inovare - ARoTT	Romania	AROTT	A
EMEL - Empresa Publica Municipal de Estacionamento de Lisboa, E.E.M	Portugal	EMEL	SME
Dumagas Transport	Romania	DGT	E
Aleph s.r.l.	Italy	ALP	SME
Liberologico s.r.l.	Italy	LIB	SME
Perform Energia L.da	Portugal	PE	SME
Movilidad Urbana Sostenible, S.L.	Spain	MOV	SME
LOGISTEMA, Consultores em Logística, S.A	Portugal	LOG	SME
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