

Task 1.3.

Assessment of the research state at the local level related to the European trends and demand analysis

PURPOSE

According to the DoW in order to fully understand the potential of the RCs it's important to evaluate on one side their position related to the research and innovation trends recorded in Europe and to the general state of R&TI, and on the other side the distance from the innovation demand perceived on the local market.

To achieve these results, it is necessary to define and to analyze the existent knowledge about the state of the European research on the specific topic of urban logistics.

This is the first part of the activity to be developed within tasks 1.3.

A specific integration will be made analyzing the trends in two main fields which represent important support technology for the urban logistics, that is the ICT and the vehicle technologies (with particular respect to electric vehicles).

Moreover the planning documents of the main Bodies in charge of technological development, namely:

- *Europe 2020 Strategy with his Flagship Initiative "Innovation Union";*
- *The existing regional R&TI policies, plans and activities, their evolution and their impact;*
- *The existing national R&TI policies and support initiatives*

will be deeply analyzed by UCVin order to prepare a reference for the evaluation of the position of each RC compared to the EU Position.

The second phase of the activities will be to prepare a document describing the position of the RCs activities with respect to this reference framework; this will be done according to the methodology developed under task 1.1 and the information collected in task 1.2 about the local situation in the Regions..

This analysis will give the possibility to characterize the specific context of the RCs with respect to the external reality in a transnational context, as the one targeted by the RCs actions should be.

The outcome of the work will be a report containing the above mentioned analysis and the results of the comparative positioning analysis.

1. ORGANIZATION OF THE ACTIVITIES RELATED TO THE ASSESSMENT OF THE STATE OF THE ART (FIRST PHASE)

According to the methodology document assessed in task 1.1 and the subsequent segmentation of the research area the following matrix describes all the technology and products to be analysed; in the same way each Technology field has been assigned to Partners in order to perform the data collection and the preparation of synthetic status of the art of each Technological field.

	General Tech field	Specific Technology	Partner in charge
1	Freight distribution management systems	Simple software systems	FRI/LIB
		Fleet management systems	
		Integrated distribution management systems	
2	Special hardware for distribution management	Palm top for delivery management	LIB
		On-board devices for freight vehicles	
3	Special software for freight distribution systems	Software tools for freight distribution optimization	MOV
4	Support systems for regulation schemes	Access control management / charging systems	IPN
		Parking management / charging systems	
		Permissions release and management systems	
5	Automatic warehousing systems and handling systems	Warehousing systems	FRI/University
		Handling and picking systems and equipment	
		Loading / unloading systems and equipment	
		Automatic weight / dimension measurement equipment	
		Automatic labeling machines	

	General Tech field	Specific Technology	Partner in charge
6	Storage systems for transport	Storage systems for transport	UPV
7	Non-conventional vehicles	Application of electric vehicles to freight distribution	UPV/PE
		Application of other non-conventional vehicles	
8	Engineering and management	New regulation schemes	MET
		New distribution process schemes	
9	E-commerce platforms	Platforms addressed by specific operators to the end users for on-line buying	IPA/DMG
		Platforms b2b addressed by specific companies to other companies, shopkeepers, and other business subjects used for purchasing and managing orders and shipment	
10	Electronic devices for goods and vehicles tracking	Barcode systems	IPN
		RFID systems	
		GPS systems	
		Wi-Fi systems	

Moreover UCV is going to prepare a document related to the general European situation taking into the account: the planning documents of the main Bodies in charge of technological development, namely:

- Europe 2020 Strategy with his Flagship Initiative “Innovation Union”;
- The existing regional R&TI policies, plans and activities, their evolution and their impact;
- The existing national R&TI policies and support initiatives.

DESCRIPTION OF THE ACTIVITIES

Each partner has to develop the activities assigned by the task leader according to the following scheme:

1. Data collection of the documents produced within within several European Programs, Civitas, CiTylog, SmartsetBestfact etcetera. Moreover the availability of advanced products and solutions on the market should be generally taken into account. This activity should lead to identify the most important and advanced technologies / solutions and the general situation of the sector in Europe
2. Preparation of the documentation which will be constituted of two parts:
 - 2.1. A short synthesis of the general situation related to the specific technological field (descriptive)
 - General Concept / Content
 - Possible integration with other technologies (within the same tech field)
 - Main applications in EU,
 - Research and technology development.
 - 2.2. For the most important technologies / application a specific record containing:
 - Description of the technology / solution (working principle, technical characteristics, etc.)
 - Main application in Europe experiences
 - Results of the applications done
 - Perceived potential
 - RTD activities in progress, if any

The annex template shows which are the main information to be collected.

Annex 1

Task 1.3: Assessment of the research state at the local level related to the European trends and demand analysis

Technology field: Automatic warehousing systems and handling systems

(please refer to the general tech matrix developed under 1.1 task)

Specific technology / solution: Handling and picking systems and equipment

(please refer to the general tech matrix developed under 1.1 task each partner for the allocated technologies)

Description of the technology / solution:

In the category of the handling systems are gathered all the tools, storage units and vehicles involved in the storing, controlling, transporting, protecting and enumerating goods at any singular phase of the goods life: the manufacturing, the distribution the consumption and the disposal. It is possible to separate the handling equipment in four main categories:

- storage and handling equipment:

It concerns the generality of the no automated storage equipment as the pallet rack (it allows the storage of palletized material in horizontal rows with multiple levels), shelving and carts.

- engineered systems:

Inside this category are gathered all the automated systems for handlings materials; for example it possible to find automated storage and retrieval systems (ASRS) in which from the storage location a computer systems is used to automatic locating and retrieving load.

- bulk material handling:

These equipment's are utilized for move and store dry materials. The system in general is composed from stationary machineries (like conveyor belt) and mobile equipment (loaders) and storage solution like silos.

- industrial truck:

These essentially assisted the goods handling systems; the forklift is the common example of industrial truck: in general these are operator driven motorized vehicles

From the above categories, especially in the automated systems, is possible to individuate the presence of the picking systems. In general the picking consisted, in a warehouse area, in

take an element from the totality of the stored elements. In the majority of cases the picking referred to the order picking systems that consisted in the order preparation: a collection of a specific quantity of articles that satisfy the consumer order. In general the picking systems are computer aided; the remained part of work can be manual handling or automated handling. For example in the manual handling systems it possible to find solution in which every storage position is equipped with a signal lamp, a display with the quantity to be picked and a button of “picked done”. In the manual handling solution it possible to find the aid of mobile terminals (for the operators movement) that are connected to the warehouse managements systems. Finally in the automated handling systems the picking of the goods is automatized: it possible to find solution in which the good are manually replenished in the vertical channel or systems that in automatic way re-loading the vertical channel (for collection of goods).

Main applications:

(referring to urban logistics field)

The main stuff concern an efficient way of move and handling the freight from the warehouse to the consumers and moreover allowing the interchange of goods from transport ways that arrive to the bounding of the city to other smart services directed to the city centre.

The common aim of the applications is to find solution that are friendly for the environment with a reduction of the air and sound pollution and moreover to reduce the delivery time and to allow a better quality life for the citizen.

The majority of the action, in the urban area, are devote to reach the delivery in the city centre especially with electric vehicles: this is one of the element that bring to an high reduction of the delivery times.

There are solutions that consider to use the ordinary traffic flow in a more efficient way: for example with the dedicated use for freight service of road lane in specific time slot or the re-

thinking of the transport services toward solutions offered by the environmental characteristic of the city (like the river).

Use and results of applications done:

(analyse the experimentations done by cities with special regards to European programs (i.e. FP7 funded projects, Civitas and other)

Concerning the use of the electrical vehicle for the freight distribution a good example is represented by the gnewt cargo practise adopted in the city of London. In this case study, of the BESTFACT -7th framework programme, electrically- assisted cargo tricycles and electrical vans are used to deliver package from a small urban consolidation centre to costumers in the centre of London. The utilized vehicles are powered with electricity produced with renewable resources so that the service is completely no fossil fuel consumption and no greenhouse gas emission.



Electri van and Electric tricycle in London (source BESTFACT)

This system is ideal for a relatively small area and is not suited to large consignments of high volume or bulky goods.

Distripolis is a logistic solution in the city of Paris, adopted by the GEODIS road transport operator. The aim is to replace the diesel fleet with a new system that is composed by three main actors: the Central depot, the Urban Consolidation centres (UCC) and the electrical vehicles. The synergy of UCC and of the green vehicle allow to extend the service in a wide area. The UCC placed in the centre of Paris received the goods, transported with Euro5 vehicle, from the central depot that is placed in Bercy and finally from the UCC the deliveries are made with electrical vehicles.



The GEODIS modal transport solution in the city of Paris (source BESTFACT)

About the time slot use of the lanes of the roads a very interesting solution is the multiuse lanes for freight distribution in Bilbao. In the city, in specific time slots, a dedicated road lane is used for loading/un-loading of goods; whereas out of the time slots the previous lanes are utilized from the normal traffic.



Multiuse lanes for freight distribution in Bilbao (source BESTFACT)

About the use of clean vehicle for the last mile delivery an efficient solution is that adopted in the city of Utrecht (Netherlands). For the delivery especially for restaurant, tourist venues and local businesses it is used a special train: it is composed by a driving, a small green electric vehicle, that drag small boxes that can be added and remove like a train.

This system is very innovative because it offers a modular delivery service using a small vehicle in the respect of the city centre.



Cargohopper service in Utrecht (source BESTFACT)

A similar service is called CITYLOG EMF that has been tested in the city of Klagenfurt (Austria): the self-driven vehicle, an electric motor propulsion cell based, and the trailers that can be joined to compose a train it utilized for the freight transportation from the local logistic distribution centre to the inner city area.



CitylogEMFin (source BESTFACT)

Inside the CIVITAS project “Sustainable Mobility Highlight” it possible to see the distribution by water adopted in the city of Utrecht: with the aim to increase the freight distribution by water the city adopted the “beer boat” that it is utilized for the deliveries of beverage to the pub, restaurant and hotel closed to the river.



Beer Boat in Utrecht (source CIVITAS “Sustainable Mobility Highlight”)

Perceived potential:

(describe the potentialities of the analysed topic in terms of future applications, impact on the process, innovation, etc.)

Between the potentialities there is the possibility to use the ordinary communication ways, road and rail way, in a more efficient manner that allow a better handling of the freight: for example the time slot of the road lane represent a good solution.

A very interesting scenario is that offered in the SAFE urban logistic project inside the Norden – Energy and Transport.

The scenario expected the collaboration between large distribution company and public transport. The model, that is effective in term of reduction of time and cost, set that during the night, when the metro and the tram are closed to the public transport, they instead delivery goods to the central station where electric vehicle can be used for the last mile distribution. For the implementation of the model it essential the design of box that can be easily transport with the metro service: as indicated in the model the box will be keep at the store, for 3-4 days, until it will be empty, and fill with things that need to be delivery out of the city.

Higher potentialities are offered by the micro trains, as already see in the cargohopper in the Utrecht city, because they represent an very good example how it is possible to adapt the vehicle and the service to the urban centre characteristics.

As reported, inSAFE urban logistic project (Norden – Energy and Transport), due to the size of the vehicle and containers the goods can be delivered by road in the city area that in general are not accessible to the normal traffic: this bring an consistent reduction of the delivery time. Very interesting is the possibilities to use the container in reverse logistics; so that the available capacity in the single container is constantly available on a dedicated web site where the company can book in real time an extra transport space at minimal price.



MICROTRAINS (Source Norden Energy & Transport)

RTD activities in progress

(describe the RTD activities in course, or the possible envisaged RTD needs)