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Policy and Decision-Making Approaches**

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1. Introduction

Even if the research field of Urban Logistics studies (and its practical applications) has been very prolific in the last decades, its impact on logistical practice has been very limited to date. Many initiatives have been implemented by municipalities across Europe in the field; however, the success of such initiatives has been questionable. This is due to a variety of reasons that can be listed as follows:

- Most of these initiatives were developed on the basis of very limited understanding and partial data about urban logistics. Indeed, most of the focus has been about distribution to retail stores and similar establishments; however, this just constitutes a fraction of the logistical flows happening within urban areas, often already involving some form of consolidation from the shipper. Traditionally, other forms of flows (such as the ones related to construction materials, waste management, materials needed in the facilities management cycle, catering industry) remained out of the picture.
- Facilities related to Urban Logistics Operations (such as Urban Consolidation Centres, UCCs) have traditionally failed to attract stable and significant revenue models that could be attractive for the whole set of stakeholders involved; for instance, delivery operations involving the usage of an UCC might end up being significantly more expensive for shippers, failing to create a convincing economic case.
- Not much research has been devoted to cost, risk and revenue sharing models that could lead to the implementation of successful Urban Logistics initiatives (including, for instance, UCCs).
- The implementation of urban logistics initiatives can be significantly affected by political decisions; often, in the European context, local political situations might be uncertain and volatile, producing significant changes in the administrative landscape. This is not

ideal for the stability and certainty requested for the success of most of the urban logistics initiatives.

Empirical evidence suggests that the design and implementation of Urban Logistics solutions should be guided by a careful assessment of their estimated impacts; furthermore, an early involvement of stakeholders from both public and private sectors should be sought, in order to evaluate the long-term sustainability of potential solutions.

For this reason, the availability of adequate tools, capable of addressing, from a multi-stakeholder perspective, also strategic issues (for instance, related to the investment planning phase) rather than just operational ones (concerned with the day-to-day functioning of already established logistical platforms) could be of interest to stakeholders involved in the policy- and decision-making process.

Within this context, this report forms part of deliverable D1.1 for work package 1 of the ProSF_eT project. As an introductory report, the main objective is to provide an overview of current initiatives in urban logistics, presenting some relevant case studies and highlighting the impact of stakeholders' engagement on the success of the implementation of such solutions.

2. Case Studies

Within urban logistics, a lot of emphasis has been placed, in recent years, on Urban Consolidation Centres (UCCs). The term UCCs identifies logistics facilities situated in relatively close proximity to the geographic area that they serve (be that a city centre, an entire town or a specific site such as a shopping centre), to which many logistics companies deliver goods destined for the area, from which consolidated deliveries are carried out within that area, in which a range of other value-added logistics and retail services can be provided (Allen et al., 2007). UCCs (also referred to as Urban Distribution Centres, UCCs) can certainly be valuable

facilities, but they should not be seen as a quick *one-size fits all* solution for any sort of problem related to logistic in urban areas.

As highlighted by Lagorio et al. (2016), so far UCCs effectiveness has been assessed mainly through multiple or single case studies analysing best practices and pilot projects. However, little is reported about the reasons for the failure of such facilities; being very difficult finding information on failed UCC projects and initiatives.

In this section of the report, we present findings from several real-world cases studies, highlighting some of the critical engagement issues as well as learning.

2.1 Parma (Italy) Case Study - EcoCity

Established in 2008, the “Agri-Food & Logistics Centre – CAL” was designed as a Urban Consolidation Centre platform in order to manage last mile deliveries of agri-food goods within Parma’s city centre. The project was firstly financed by the Emilia-Romagna region and by the local municipality, which created “EcoCity”, a company owned by Parma’s city council that also managed all its operations (Morganti and Gonzalez-Feliu, 2015).

The project required a first investment of 2M€ and was soon praised as best practice by different researches (Fitconsulting, 2013). Specifically, the project consisted in the creation of an urban distribution centre, where agri-food products were daily brought by carriers and then delivered to customers via methane-fuelled vehicles, with an optimized load capacity and following optimal routes (Morganti and Gonzalez-Feliu, 2015). Innovative characteristic of the project was also the opportunity for local stores, adhering to the initiative, to order products directly through EcoCity website, getting them delivered in a few hours, straight into stores (Vaghi and Percoco, 2011).

By 2015, the project involved, “16 transport operators and carriers, 17 food manufacturers and suppliers (fresh and dry products), 7 corporate chain retailers and 10 produce wholesalers” (Morganti and Gonzalez-Feliu, 2015) serving approximately 250 local food businesses, resulting in the management of roughly the 8% of all the food distributed in Parma. From an environmental point of view, the

EcoCity project helped reducing PM and NO_x emissions by 29% and 22% respectively (Morganti and Gonzalez-Feliu, 2015).

Although apparently very good from an operational and environmental point of view, the EcoCity project encountered similar issues as many city logistics pilot projects faced before it. Financially, the project continuously increased its debt, without being able to repay investors. In 2013, the total amount of EcoCity's debt was 14.5 M, leading to the distraint of several vehicles by creditors (ParmaQuotidiano, 2013a; La Repubblica, 2013).

In this regard, Parma city council tried to sell EcoCity to private partners for four times (ParmaQuotidiano, 2014). For three times no company showed interest in investing into it, until, in 2014, Coop Taddei Group decided to acquire EcoCity, leaving the EUR14.5M debt to the local administration (ParmaQuotidiano, 2013b; ParmaQuotidiano, 2014). Even though no data was found regarding the price requested the fourth time, the city council had already lowered the requested price from 332,000€ to 265,600€ (ParmaQuotidiano, 2013b). Therefore, it is reasonable to assume that the price dropped further, underlining the serious issue of UCCs valuation and transition post implementation, particularly as financially sustainable ventures.

2.2 Lucca (Italy) Case Study - LuccaPort

Opened in 2007, LuccaPort is an Urban Consolidation Centre, located in Lucca (Tuscany - Italy), managed and owned by Lucca Holding and, therefore, by Lucca city council as it is Lucca Holding's only shareholder (Scintu, 2016). Lucca city council invested a significant amount of money in the LuccaPort project – approximately 5 million euro – with the purpose of promoting sustainable freight transport in the urban context of Lucca, reducing the high level of pollution that was constantly increasing in the city centre area (Salotti, 2017a).

LuccaPort is located in a strategic geographical area, well connected with the principal highways and is equipped with an electric fleet of vehicles, of which purpose is that of reducing the impact that congestion and pollution cause to the city centre. This accomplished by receiving goods

from carriers and, consequently, by managing last mile deliveries in the city centre area utilizing LuccaPort's own fleet (Salotti, 2015).

Although ambitious, the project has been running for several years without generating the expected results. For overcoming this issue, the city council dismissed Metro s.r.l. – which previously managed LuccaPort – trying to find companies willing to invest in the project (Salotti, 2017b). However, this strategy has not been successful as for several times no company has shown any interest in the project. Even though in 2015 Manutencoop facility management – an Italian company – showed interest in making such investment, the deal was not successful as the company withdrew before signing the final contract (Il Sole 24 Ore, 2017).

To solve the issues generated by LuccaPort, the current local administration has decided to take different actions. Firstly, LuccaPort will undergo a new phase of study where the focus will be put on the understanding of the criticalities encountered during its activity. Secondly, collaborating with an IT company the city council wants to understand how to integrate the study of big data with Lucca's urban structure, to gain specific data about congestion. Lastly, by trying to get funded by the Life Aspire project, a European project which aims at promoting sustainable urban logistics, the city council aims at finding the necessary amount of funds needed to back this new project (Salotti, 2017b).

2.3 Huddinge (Sweden) Case Study – Södertörn 8

The Södertörn UCC initiative focused on consolidating supplies to public schools within the Stockholm sub-region. A total of 8 municipalities participated in the scheme which transited into an operation in 2017, following 2 years of trial. The regional authority worked closely with a number of partners to review and plan the transition into an operational venture, successfully trialling the UCC transition phase. Some emergent indicators of its successful transition include early and pre-implementation consultation with a wide range of stakeholders, including the selection of a transition partner prior to the commencement of the project phase. Despite its

success, some vital issues still concern the private management company Widrikssons, who highlighted IT legacy interoperability and contract duration as some critical management objectives that pose significant challenges for the venture. IT legacy interoperability can lead to scope creep, where management firms have to bear the extra costs of integrating new suppliers into existing legacy frameworks, often not included in the initial consultation scope of the projects. Additionally, longer term contracts are considered as useful incentives for increasing the financial attractiveness of UCC projects and this can further support the initial profitability considerations of the interested private management parties. Stakeholder engagement tools that factor in these critical components remain scarce.

2.4 Sheffield (UK) Case Study – Meadowhall

Meadowhall remains one of the UK's largest shopping locations sprawling a large expanse of land and river and hosting over 20 million visitors annually. Although there are a number of alternative transport modes including train-tram, the principal access mode is road. With increasing number of shoppers and pressure on retailers, the resulting traffic congestions, land use and emissions raised concerns for the city and Meadowhall's management.

Clipper Logistics were appointed to trial and manage a consolidation facility for retailers in 2006 following some consultation and mini-tender process (Allen et al., 2014). Some key indicators for the project included carbon emissions reduction, efficient delivery and reverse logistics. The project has been deemed successful and remains operational with savings in transport journeys, emissions and capacity utilisation.

Our recent observations have seen the opening of new shopping facilities in the area with some infrastructure investment in specialised retailing around the area. There are still gaps in terms of measurement metrics for reported emissions data (database), scope of indicators measured in terms of the UCC and its contribution as a freight solution as well as stakeholder engagement

methodology employed in the tender process. However, a significant outcome is the successful experimentation and implementation of the UCC initiative.

2.5 Vicenza (Italy) Case Study - Veloce

Veloce Vicenza is a city logistics initiative that was established in Vicenza (Italy) by its local administration in 2004 (FerPress, 2017). It functions as an UCC which is located outside the city centre; where carriers can bring goods, which are then delivered within the city centre via sustainable vehicles such as electric or low-emission ones (Ville et al., 2010). The initiative is most renowned for the legal feud between the local authority and international logistics companies such as DHL, TNT, UPS and FedEx (Ville et al., 2010). This was firstly originated by the regulations that the local authority imposed to all logistics companies operating within the city centre, forbidding them to enter all Vicenza LTZ areas – basically precluding them any sort of entrance to the city centre. In this regard, in 2008 DHL Express Ltd, TNT Global Express SpA, Federal Express Europe Inc. and United Parcel Service UPS Italia SRL, instituted an association, the AICAI (Italian Association of International Air Express Carriers), requesting before the Veneto (Italian region in which Vicenza is located) regional administrative court – TAR – the cancellation of such ordinances. In the first place, the court's verdict was favourable to the AICAI, sentencing the annulment of Vicenza city council's ordinances. However, the city council submitted an appeal to the Italian State Council, which, in 2009, overturned the previous results, justifying Vicenza local authority's regulations as “necessary for the protection of the cultural and environmental heritage” (Ville et al., 2010).

Although the sentence allowed Veloce Vicenza to be the only entity managing last mile deliveries in the city centre, carriers have tried to find alternative ways to overcome this obstacle. For example, in 2011, carriers have begun using ‘*riscios*’ – a type of bicycle, to complete their last mile deliveries, thereby boycotting the Veloce Vicenza facility since 2011 (Negrin, 2011). As a result,

the project has suffered financially and remains a burden on the local authorities who have had to invest further funds to make the project continue (Il Gazzettino, 2015).

While the project has been represented as ongoing, its success remains questionable when the engagement failures and cost to the city authorities are taken into consideration. Perhaps its success as a study location and learning on the powers of city authorities to enforce sustainable urban logistics may afford some lessons.

2.6 Padua (Italy) Case Study - CityPorto

Established in Padua (Italy) in 2004, CityPorto represents the urban logistics strategy put in place by the Padua city council in order to manage last mile deliveries within Padua city centre, utilising low-emission and electric vehicles. CityPorto's vehicles are kept in and managed by the city's local urban consolidation centre (Interporto Padova S.p.A.), which covers an area of 1.1M m² (Interporto Padova S.p.A., 2013)

The project represents one of the few fully successful urban logistics projects at a European level. The fundamental prerequisite that this project has been able to satisfy has been the establishment of a dialogue with different stakeholders (Gonzalez-Feliu and Morana, 2010). Indeed, contrarily to what happened in the Vicenza case illustrated in 2.5 (where international carriers have been forbidden to enter the city centre without any sort of dialogue taking place before this decision) Padua city council decided to collaborate with logistics providers (DHL, Bartolini and GLS); such providers bring goods to the UCC, while last mile deliveries are managed by CityPorto fleet (Interporto Padova S.p.A., 2013).

The overall performance of the service has been constantly improving: deliveries have increased by 126% between 2005 and 2015; environmental indicators have reported significant progress in terms of PM pollution, CO₂, SO_x and NO_x emissions (Trasporti-Italia, 2015). Furthermore, Interporto is constantly investing in its capacity – which now is roughly 1M containers/year –

and into CityPorto's fleet – new methane-fuelled vehicles are joining the fleet in 2017 (Il Mattino di Padova, 2017).

Padua's model has been recognized as best practice also by other Italian cities, such as Aosta, Rovigo and Modena, which, collaborating with Padua, are trying to implement similar city logistics solutions within their cities (Il Mattino di Padova, 2017).

Therefore, CityPorto is definitely a best practice in the field of city logistics and last mile deliveries. The major strength of the project can be related to strong relationships, established between Interporto S.p.a. and some of the major logistics companies. This project denotes that, contrarily to what happened in Vicenza, efficiency can be reached through an enhanced dialogue between city councils managing UCCs and logistics providers, fostering collaboration instead of competition.

2.7 Barcelona (Spain) Case Study - SuperBlock

In the recent years, Barcelona, the largest city and capital of Catalonia – autonomous community of Spain – has been facing serious issues linked to pollution. In fact, the Catalan city has been constantly exceeding the recommended thresholds set by the World Health Organization with regard to nitrogen dioxide and particles (Brass, 2017). This, has then been linked to an average of more than 3500 premature deaths caused by pollution per year, becoming a serious matter to deal with (Garfield, 2016), especially considering that urban freight is expected to increase by 40% by 2050 (Hu, 2016; Michell, 2017).

In this regard, in 2013, the local administration presented to the central government the “Urban Mobility Plan” (Navarro, 2016). Its objectives were that of reducing, by 2018, traffic by 13% and air pollution levels by 21% (Hu, 2016), by implementing the so-called Superblocks. A Superblock exploits the unique layout of Barcelona which is based on a distinctive grid system (Figures 1 and 2), refocusing planning on liveability and on creating a better environment for residents (Stewart, 2017).

Inside these superblocks, as can be seen in Figure 2, only residents and urban services can circulate. Moreover, freight transports are managed utilizing electric bicycles and tricycles, leading to a reduction in the level of pollution (Toscana24 - Il Sole 24 Ore, 2017; Vaghi and Percoco, 2011).



Figure 1 - Barcelona grid system (Source: Google Maps)

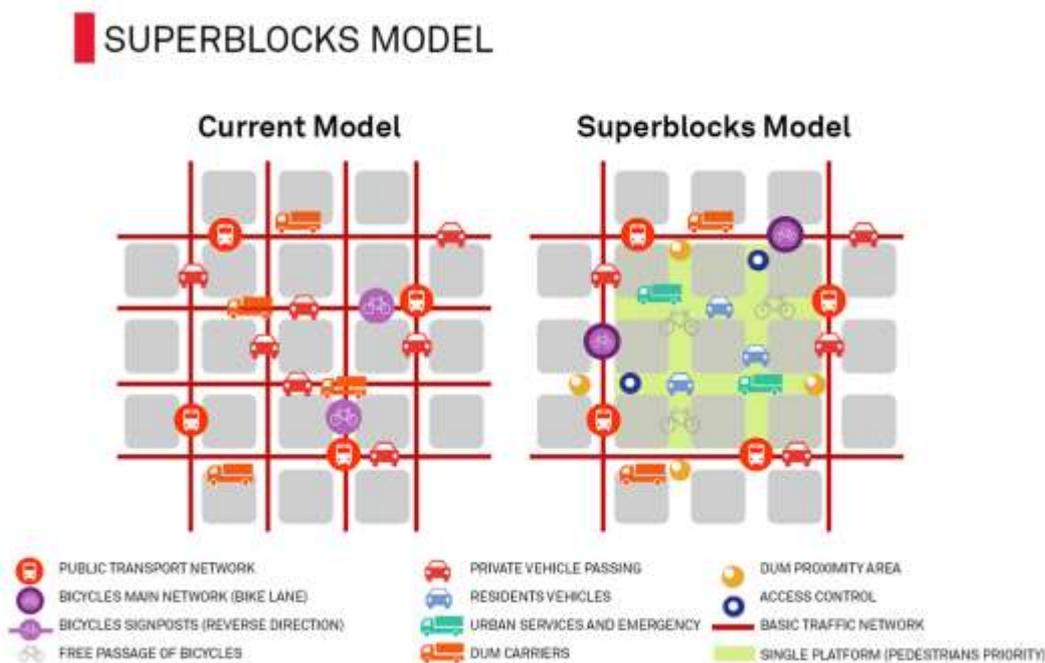


Figure 2 - Example of superblock implementation (Source: Stewart, 2017)

In 2016, the first Superblock pilot project was implemented in Poblenou – a neighbourhood in Barcelona – and five further pilot projects were originally scheduled to be implemented in 2017 (Hu, 2016).

Although results have been positive with regard to air pollution, traffic congestion and a more sustainable urban freight transports, the first pilot project in Poblenou, costed approximately €55000, received mixed reactions from citizens (Hu, 2016; Garfield, 2016). In this regard, Vincente Guallart, founder of the Institute for Advanced Architecture of Catalonia commented the implementation of the Superblock in Poblenou as follows: “The big mistake done with the test was to build without a budget and without discourse with the citizens” (Brass, 2017). Therefore, this case study is a clear example of how a lack of stakeholders engagement and of structure planning phases – in this case primarily financial – can lead to a long term unfeasibility. Nevertheless, the Superblock project is still going on, even though it will probably need more time to be implemented than what was scheduled. It is, however, noteworthy mentioning again how such projects require stakeholders engagement in planning phases in order to be accepted by communities and to be sustainable in the long run.

2.8 Other Case Studies from European cities

This section aims at analysing other urban logistics implementations carried out across Europe. Although for some of these projects relevant information regarding results and current phase of pilot projects could not be found, it is important to put focus on them, highlighting how, in Europe, several local administrations have been working towards a more sustainable urban freight transport.

In Gothenburg, Sweden, the local administration launched, in 2012, the Stadsleveransen project (see also Figure 3) which *“involves the consolidation of numerous small deliveries by ICE-powered vehicles destined for the city centre in micro-terminals, which are then distributed over the ‘final mile’ using zero-emissions vehicles”* (Baer, 2016). This has helped Gothenburg to reduce congestion and to turn several areas of the city centre into pedestrian areas (Eriksen, 2015). Currently, in the areas in which it operates, Stadsleveransen project accounts for the majority of the deliveries, although it manages just 20% of the goods volume (ViajeoPlus, 2013).

Similarly, in 2009, the Dutch city of Utrecht and, later on in 2013, the city of Amsterdam have implemented the so called Cargohopper: a solar-powered electric caravan of trailers that allows companies to leave their goods at a warehouse outside the city limits, having them delivered in a more sustainable way utilizing the caravan as seen in Figure 4 (Morrell, 2017; Holder, 2017).



Figure 3 - Stadsleveransen van utilised for last mile deliveries in Gothenburg (Source: Baer, 2016)



Figure 4 - Cargohopper van utilised for last mile deliveries in Utrecht and Amsterdam

(Source: www.amsterdamsmartcity.com)

In this regard, Utrecht city council has announced its commitment for making Utrecht a climate-neutral city by 2030 (Schiller, 2011).

Moreover, in the German city of Frankfurt, a similar pilot has been implemented, allowing a part of the urban freight transport to be managed utilising electrical bicycles and tricycles (Morrell, 2017).

In central London, UPS – leading logistics company – in collaboration with Outspoken Delivery, cycle-based delivery company – is trialling a ‘depot-to-door’ delivery system, promoting a more sustainable way of managing last mile deliveries, transporting goods directly from the depot to the delivery location utilizing electric cycles (Holder, 2017).

Similarly to what happened in Barcelona (section 2.6), also in Vitoria-Gasteiz (within the Basque Country Region of Spain) a new mobility and urban space framework based on superblocks was implemented. Within the participation of the municipality to the CIVITAS MODERN initiative (from 2008 to 2012), several urban logistics measures were implemented, with the specific aim of developing a superblock structure within the city centre (Albaina and Escudero, 2017). While associated investments could be a barrier to the implementation of such solutions, it must be highlighted that they represent a low-cost alternative compared to UCCs.

From all the case studies analysed in this report, it is possible to note that, in the last years, European countries have been focusing on urban freight transport and on the promotion of more sustainable ways of managing last mile deliveries. This, however, requires efficient stakeholders engagement to produce long lasting results, allowing local administrations and communities to adapt to changes in a more effective way.

To conclude, stakeholders engagements, especially during planning phases has emerged as core component of these kind of implementations. Therefore, it is essential, when planning such

projects, to consider these elements as of fundamental importance, both for facilitating short-term implementation and for allowing such projects to remain profitable in the long run too.

3. Early Findings

Early findings from the ProSFeT project, corroborated by the extant literature and by interaction with stakeholders, demonstrate that:

- Stakeholder engagement is very crucial to the success of sustainable urban logistics initiatives.
- Although the literature is advancing, the access to and application instances of existing stakeholder engagement techniques in SUL remains relatively rare.
- Local Authorities require expertise or expert solutions that use decision support systems in order to obtain optimised stakeholder preference overlap in the mapping, consultation and decision process for urban freight solutions.
- Stakeholder engagement techniques currently utilised by local authorities require further development to support Multi-Criteria Decision-Making (MCDM) scenarios.
- Pathways for the implementation of stakeholders' engagement techniques in practice include tripartite collaboration between public, private and educational institutions.
- There is need for more participatory approaches that involve local authority participation in the development of MCDM frameworks that support real application of models and methods by a wide range of local authorities.
- Empirical evidence suggests that their design and implementation should be guided by a careful assessment of their estimated impacts. For this reason, the availability of adequate tools, capable of addressing also strategic issues (for instance, related to the investment planning phase) rather than just operational ones (concerned with the day-to-day

functioning of already established logistical platforms) could be of interest to stakeholders involved in the policy- and decision-making process.

4. Recommendations

- Participative / involvement processes are often complex processes and need a professional approach. Therefore, it is recommended not to let them run by one of the stakeholders, for example a municipality, but by independent professionals.
- Stakeholder involvement should be maximized from the planning stage as partnerships underpin the success of sustainable logistics measures.
- More collaboration is required between different stakeholders in order to optimise planning very early on, i.e. at the conceptualisation and design stages of various city logistics projects.
- More robust decision support systems can support stakeholder mapping, engagement and objective decision-making at local authority levels

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