Urban freight in small-medium cities: the Bergamo case from inception to stakeholders involvement

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Extended abstract

Objectives and motivation
Urban population is steadily growing, bringing along a manifold increment of demand for goods and services, mainly concentrated in relatively limited or overly constrained areas. This is inevitably leading cities around the world to face increasing challenges in terms of efficient transportation of goods, while controlling – and ideally reducing – its negative impacts (i.e., congestion, pollution, noises, accidents…) on the quality of life of their citizens, without penalizing the city’s many economic, social, administrative, cultural, touristic, and other activities (Benjelloun et al., 2010).

In this respect, many cities around the world are undertaking city logistics projects (CLP) to address the above mentioned context, with the aim at optimizing the logistics and transport activities by public and private actors in urban areas while considering the traffic environment, the traffic congestion, and energy consumption within the framework of a market economy (Anand et al., 2012). Just to name a few, the experience provided by the Padova Cityporto project1, the project Annona in Saint-Étienne2, and the LAMILO project in Luxembourg3 are good representatives of the efforts devoted on the topic.

In this paper, we illustrate and discuss the main results of a CLP carried out in Bergamo, a mid-size city in the north of Italy, close to the alps and to a major city like Milan. As part of a larger project about smart cities called Bergamo 2.(035) A new Urban Concept in a changing World led by the University of Bergamo, the Bergamo Logistica project aimed to design and develop activities to identify and analyze i) the main issues, ii) the local ongoing projects and initiatives, and iii) the ideal directions of development in a small-medium city. Therefore, in the paper we discuss the main evidences and findings gathered so far through several investigation activities, including literature analysis, workshops and interviews with the main stakeholders. In doing this, we mainly highlight the main issues to address and the main barriers against the development of a city logistics project.

Furthermore, as a CLP inherently involves many logistics-related decisions along several dimensions (from the definition of the best place for locating logistics activities such as urban distribution centers, to the last-mile delivery planning and execution, from the organization of limited traffic zones to the deployment of environmentally sustainable fleets of vehicles), we illustrate the Bergamo case study with a particular emphasis on the role of the stakeholders, their involvement in the project, and the resulting initiatives that emerged from a co-creation process involving public authorities and private stakeholder, associations at different levels, research centers and common citizens, among the others (Stathopoulos et al., 2012).

The Bergamo Logistica project
At the beginning of the Bergamo Logistica project we identified a number of possible solutions to improve urban freight within the city boundaries and through the city center of a typical mid-size European city, of which Bergamo can be an example for its characteristics (e.g., population, position with respect to other cities) and for the constraints it is subject to (e.g., conformation of historical center, local regulations).

As a starting point, we identified some general trends related to the transportation of goods in Bergamo, such as the slow but steady increase of the population in urban areas, the fragmentation of demand both geographically and over time, the diffusion of e-commerce with the related last-mile delivery issues, the relatively high number of small and medium-sized shops in the city center, the request for more flexible and timely delivery lead time, the increase in the frequency of delivery (especially requested by small-shop owner that do not want to keep large inventory stocks), and the increasing number of actors (stakeholders) in the sector. The identification of these trends was based on several sources (ISTAT, Transport White Paper, European Commission documents, extant literature, observations).

Subsequently, we revised the main and more recent city logistics solutions proposed both by different Italian actors (in particular, Lombardy Region) and from the literature. According to the Lombardy Region guidelines, we grouped the solutions into four main areas: Access restrictions, Infrastructures, Technology, and Regulations (Table 1). Within these areas, we have identified several unique solution proposals based on what already exists in Europe and in Italy, and based on solutions that have a different level of complexity and may therefore be implemented gradually.

We performed several analyses in parallel involving local actors: in particular, we identified and involved through direct interviews several public and private stakeholders to understand their critical viewpoint and their perceived issues in delivering goods in city center. Furthermore, we administered a questionnaire to transporters and retailers to understand the viewpoint of operators in their day-by-day activities.

1 http://www.interportopd.it/en/cityporto/
2 http://www.agence-nationale-recherche.fr/?Project=ANR-13-VBDU-0001
3 http://www.lamiloproject.eu/
job with regards to the characteristics of the urban distribution of goods (schedules and delivery times, number of suppliers, load factor ...)

To further address stakeholders involvement we established a working group composed of stakeholders (including the municipality) and research members with the aim to discuss the main findings from the analysis. In particular, we asked the stakeholders to list the main problems they found and put them in order of importance according to their opinion. This working group represented a good opportunity to illustrate and discuss with the stakeholders the solutions we found, actively involving them in the analysis and comparisons. The results of stakeholders involvement were also evaluated adopting valuation techniques from management theory (i.e. house of quality). In the full version of the paper we present more deatiled results also displaying schemes and tables.

Finally, on the basis of the evidence from the literature review, data collection of Italian and European city logistics projects, and especially of data collection conducted among stakeholders, we developed a roadmap for the city logistics in Bergamo, starting from more softer, easier and low cost solutions that can be implemented in a short time (establishment of a permanent working group about freight transport in Bergamo, creation of a data sharing platform and optimization of limited traffic zones (LTZ) an of loading / unloading areas) up to more complex solutions (establishment of one or more urban distribution centre) through intermediate solutions, such as the possibility to use clean and low emission vehicles, or even cargo-bike for freight distribution in Bergamo.

**Results and conclusions**

In conclusion, we highlight the most critical aspects that are aligned to but also enrich the existing literature:

- The city of Bergamo lies in a highly populated area close to two large cities (Milan and Brescia) and surrounded by hundreds of smaller municipalities. When designing a solution for one city (in our case, Bergamo), this must be evaluated from the global point of view, as its benefits may be just the result of a simple shift of the issues in the town or village immediately adjacent. For this reason, it is important to emphasize the consultation working group as an essential tool for the success of city logistics initiatives.
- Harmonization of decisions, activities and regulation may represent fundamental elements. Indeed, it is necessary to share common guidelines, in order to obtain real benefits. This point is very complex and very critical because, as often happens, it may induce a reduction of a possible local benefits in order to obtain a better result at the systemic level.
- Cooperation of private freight companies is essential for successful freight planning; however, it is sometimes difficult to get freight companies involved in the planning process. This may be because they want fast action that does not occur or they do not understand the time-consuming planning process of public agencies (Chatterjee, 2004).
- Public and private stakeholders are more likely to adopt solutions that they can see applied in the short term; therefore, it is important to introduce city logistics solutions that are implementable and allow to gradually change attitudes, behaviors and regulations.
- Given their constraints, the limited traffic zones (LTZ) in the upper and lower town can be an ideal starting point to develop and test new solutions (e.g., cargo bikes).

As for many other studies in the area, one limitation of our paper lies in the lack of data about freight movements that constrained the possibility to develop quantitative studies and precise cost-benefit analyses only to small portions of the city.

**References**


**Keywords:** City logistics, urban freight, sustainability, last-mile distribution, engineering perspective

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4 For space constraints enforced in this extended abstract, the evidence emerging from the collected data will be reported directly in the full paper.