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How can urban goods movements be surveyed in a megacity? The case of the Paris region

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Abstract

This paper describes the survey method built to carry out the UGM survey in the Paris region. The size of the city, around 12 million inhabitants spread over a territory of 12,000 km², and the cost constraints led us to design a specific sampling methodology based on a typology of the 1,300 Parisian municipalities. Thus it was possible to capture all the movements and main logistical behavior of the city by surveying only 1,200 establishments.

1. Introduction

In France, knowledge of goods movements occurring in urban areas owes much to the surveys performed in the 1990s in three cities with different sizes and spatial configurations: Bordeaux (836,000 inhabitants), Dijon (238,000 inhabitants) and Marseille (1,557,000 inhabitants). These surveys, performed according to a novel methodology developed by the Laboratoire d'Economie des Transports in Lyon (Bonnafous, 2000), were demanded and sponsored by the French Ministry of Transport, the ADEME and local authorities, to fill in the gaps that had become apparent in recent decades regarding knowledge of goods transport in cities (Garrido, 2001). Indeed, up to the 1990s,

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the concerns of public actors had for long focused on interurban goods transport, neglecting last mile trips and the last link in the supply chains irrigating the city. This was also the case in many other countries (Ambrosini and Routhier, 2004).

The French surveys were the first to our knowledge to include all the flows of goods exchanged between all the economic activities of a conurbation and its urban area†. This space includes the majority of the economic activities that supply the city with the goods it consumes (wholesaling, hypermarkets, the main peripheral warehouses). Thus the surveys included all the transport operators (own account, third party), all types of vehicle (from two-wheeled vehicles to semi-trailers), and all goods deliveries and pickups (from express courier service to full loads). These surveys made it possible to quantify the deliveries and pickups generated by businesses, characterize the logistics organizations deployed (vehicle, round or direct route, number of stops, the type of transport operator), take into account the conditions under which establishments were served (mode of parking, handling facilities used) and measure the quantities of goods transported according to their type, packaging and weight. The convergence of the results obtained from these three cities also led to the development of the Freturb model, which allows any city that wishes, to simulate the goods movements within its boundaries (Routhier and Toilier, 2007). The particularity of this model is that it allows evaluating the flows of goods generated by the economic activities of an urban area without it being necessary to carry out a specific survey, thus making it easily affordable for local authorities. This is why fifty French and European cities have adopted this model.

15 years after this initial wave of surveys, in an economic context marked by the stagnation of GNP that has led enterprises to reorganize to reduce their costs and by the generalized use of the Internet and new information technologies that have radically modified goods management, traceability and purchasing behaviors, the French Ministry of Transport wanted to update its knowledge of this segment of urban mobility (Ambrosini and Routhier, 2004). Since only partial funding was provided by the government, a call for offers was launched in French cities to select those that would be used to carry out these surveys. The fact that this initiative came from the government is a particularity of the French system. Indeed, such surveys are difficult to consider in most other countries, as they must be paid for solely by the local authorities concerned.

The administrative region of Île-de-France, which includes Paris, was the first to express its desire to participate. Its selection immediately raised several questions: that of the spatial scale chosen (the region rather than the city), that of its representativeness (with a population of 12 million, the Paris region holds foremost position in the French hierarchy of urban areas, with six times more inhabitants than Lyon, the second city on the list), and that of feasibility (how is it possible to survey such a vast and atypical territory without huge costs?).

As the Parisian urban area approximately corresponds to the administrative region, the first question can be discarded immediately. Regarding the second, the specific nature of the Paris region argued in favor of carrying out a survey in it to obtain a full panorama of goods movements in French cities, by enlarging the scope of investigation to a megacity. Thus the last question of "How" remained and the aim of this paper is to clarify this point by first presenting the survey methodology considered to make comparisons with previous surveys, then the work performed on the sampling to reconcile the methodology with the financial constraints. Lastly, the first results are discussed and briefly compared to those of the surveys of the first wave.

2. Methodology of Urban Goods Movement Surveys: UGMS

Here, we summarize the main lines of the survey method. For more details the reader can refer to Patier and Routhier (2009), Patier et al. (2015). The analysis of urban goods flows for a long time came up against the complexity of the urban environment in which a multitude of actors, activities and regulatory systems are present. This complexity affects organizations (round sizes and small vehicles), meaning that the indicator generally used to measure interurban exchanges (ton*km) cannot be applied within cities. The success of the first UGMS above all

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† In France, the urban area defines the area in which the inhabitants have access to all the usual services of a town or city, whether functional (jobs, daily mobility) or economic. It is composed of a number of municipalities, covering a single space without an enclave, with an urban center, and with rural municipalities or urban units (urban fringes) where at least 40% of the resident population having jobs works in the center or in the municipalities within its sphere of attraction (INSEE).