

HOW IS OWN ACCOUNT TRANSPORT WELL ADAPTED TO URBAN ENVIRONMENTS?

CRUZ, Cecilia, University of Cergy-Pontoise, MRTE (Mobility, Networks, Transports, Environment) & Paris-Est University, INRETS (The French National Institute for Transport and Safety Research), SPLOTT (Production Systems, Logistics, transport Organisation and Work). 2 rue de la Butte Verte, 93166 Noisy-Le-Grand Cedex, France. Mail: Cecilia.cruz@inrets.fr

ABSTRACT

Own account transport is commercially invisible but its importance in urban freight is significant: it represents half of deliveries. Generally research efforts focus mainly on third-party transportation because data is more available in spite of a lack of urban data. Nevertheless, the organization of transport by a shipper is not the same than third-party transport. The products transported, the constraints, the demand of transport are different. This analysis shows that own account transport is well-adapted to urban areas because of the density of deliveries and an increase of the number of establishments of the shipper who extends its areas of customer and makes profitable its fleet.

Keywords: urban freight, own account transport, density of deliveries, time delivery

1. INTRODUCTION

It is difficult to define the extent of cities. In France, urban areas are referred to as 'urban units' (*unité urbaine*),¹ when they meet certain morphological criteria (the continuity of the built environment) and surpass a population threshold of 2000 inhabitants. This same threshold is often used in international comparisons (Moriconi-Ebrard, 1994). This definition of cities was established by the INSEE² in 1954, but as suburbanisation progressed additional definitions were created. In 1997, the INSEE created a new kind of zone called the 'urban area' (*aire urbaine*) which is composed of an urban hub and a suburban ring (Fig. 1). This second definition of cities, which is the one used in this article, allows for a more functional vision of urban space because it takes employment into account. Through the

¹ According to the INSEE (French National Institute of Statistics and Economic Studies), more informations : www.insee.fr

² French National Institute of Statistics and Economic Studies

distinction between urban hub and the suburban ring, it is possible to consider conditions specific to the density of areas without ignoring less dense zones in the urban periphery, which may be home to industries with strong connections to the rest of the urban area. The polycentric dimension of cities is also better accounted for.

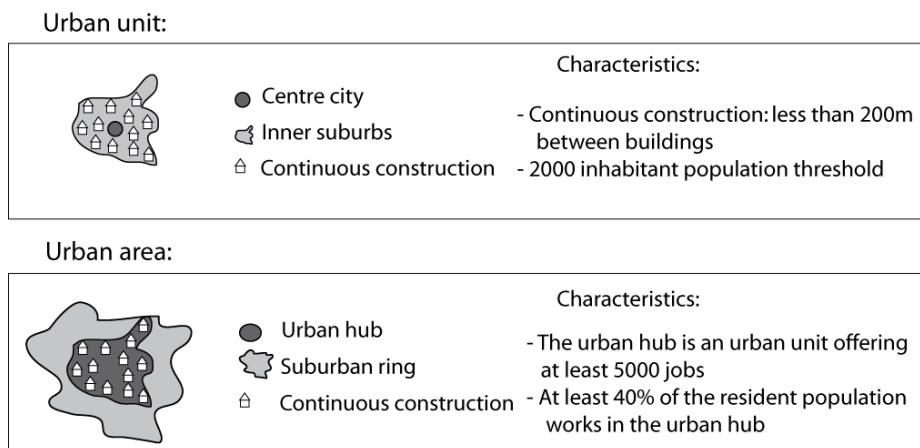


Figure 1: Two ways to define the extent of cities: the urban unit and the urban area

The urban environment is characterized by a concentration of production and consumption. As Ogden (1992) said, the freight is “complex and heterogeneous” and means that “there is a multitude of ‘actors’ in the urban freight scene, and therefore a multitude of perceptions of the ‘problem’.” This space is regularly the subject of tensions, from both an urban planning perspective and that of human and freight traffic. Urban freight transport, which can be defined as all movement of goods within an urban environment, is often considered to be a nuisance because of the predominance of road-based modes. It is nonetheless necessary for the city to function.

There are two basic ways to organize freight transport: a shipper may organize and carry out transport using its own means, which is referred to as own-account (OA) transport; otherwise it uses an external transport service provider, which is called third-party (3P) transport. Own-account transport is rarely studied, and literature on the subject is limited. In 1992, Ogden published a book on urban freight but own account transport is not analyzed in details. The lack of information is probably due to the difficulty of identifying and contacting own-account shippers. These firms see freight transport as an essential, strategic aspect of their work,³ and as such they are often hesitant to reveal details.

The studies on own-account freight transport that do exist tend not to mention the fact that this kind of organisation is quite urban. However, its presence in the city is far from negligible: in France, the Transport and Goods in Cities surveys⁴ have shown that the majority of urban delivery and pick-up operations are done on an own-account basis (Patier,

³ 21% of small businesses (less than 19 employees on the scope of ECHO survey 2004) have their own fleet (Source: ECHO survey)

⁴ "Enquêtes Transports de Marchandises en Ville" carried out in Bordeaux in 1994 and in Dijon and Marseilles in 1997 by the Transport Economy Laboratory (LET).

2004). More than three fourths of paths⁵ in Bordeaux and Marseilles are handled on an own-account basis, and half of those in Dijon (Patier, 2002). Thus, the urban territory seems to be conducive to own-account shipping. In this article, we will explore the reasons for using own-account shipping in urban environments, and the relevance of its use in a context where the overall share of own-account traffic is decreasing (in France, its share dropped from 26% of tonne-km in 1995 to 16% in 2007; in Germany, the share fell from 35% to 21% over the same period⁶). Though its share of all traffic is diminishing, own-account transport is still very present over short distances. In France, its share over short distances has been increasing for two decades (Cruz, Zembri, 2009). In Germany, 47% of tonne-km travelling less than 50km were own-account, and in the UK the figure is 45% (2007).

In 2004, the INRETS⁷ conducted an original survey on transport practices (Inset 1). In this survey (ECHO 2004) shippers were questioned about their shipping practices, revealing connections between the production system and transport. Another objective of this survey was to take the increasing complexity of transport chains into account. To do so, shipments were traced from their departure point to their destination, revealing the different steps that a single shipment passes through to reach its recipient. Here, we have complemented this quantitative approach with a more qualitative case study of a specific firm that uses own-account transport, allowing us to examine the relevant spatial extent of this kind of shipping.

- 3000 firms were surveyed, representing a total population of more than 69,000 firms
- **Scope:** All firms with 10 or more employees belonging to the industrial sector (apart from mining) and the wholesale trading sector. Only sending shipments of at least 1 kg were surveyed.
- **Principle:** Monitoring shipments sent by the shipper until they reach the consignee and reconstructing the entire transport chain.
- **A shipment** is a group of goods sent between one consignee and one consignor.
- **Goals:**
 - To link shippers' production activity to their choice of transport,
 - To monitor the shipper's shipments until they reach the consignee in order to perceive the multiplicity of journeys and modes of organization.

Inset 1: the 2004 ECHO survey

Reliance on own-account transport is the result of logistic constraints which are specific to those sectors that use it. First, we shall see how the concentration of activity in the city makes it a place where shippers can achieve cost savings by managing their own transport. Secondly, we will evaluate the role that timing plays in this choice, and the implications at the metropolitan scale. Next, we will attempt to identify which territories are most relevant for the use of own-account transport through a case study. Finally, we will examine the role of legal constraints on transport choice, looking at both vehicle type and delivery hours, and discuss transport supply in urban environments.

⁵ Path: All points passed through by the delivery driver to pick up or deliver goods.

⁶ Data: Eurostat

⁷ The French National Institute for Transport and Safety Research

2. MANY FIRMS USING OWN-ACCOUNT TRANSPORT ARE CONCENTRATED IN THE CITY

The urban environment is conducive to the use of own-account shipping. The 2004 ECHO survey shows that own-account shipments are predominantly urban. 92% of own-account shipments have urban points of origin, and 80% have urban destinations. 50% of own-account shipments are carried out within a single urban area⁸. These figures confirm the urban character of own-account transport. In our analysis, we will concentrate on flows within a single urban area in order to highlight the local role of own-account shipping.

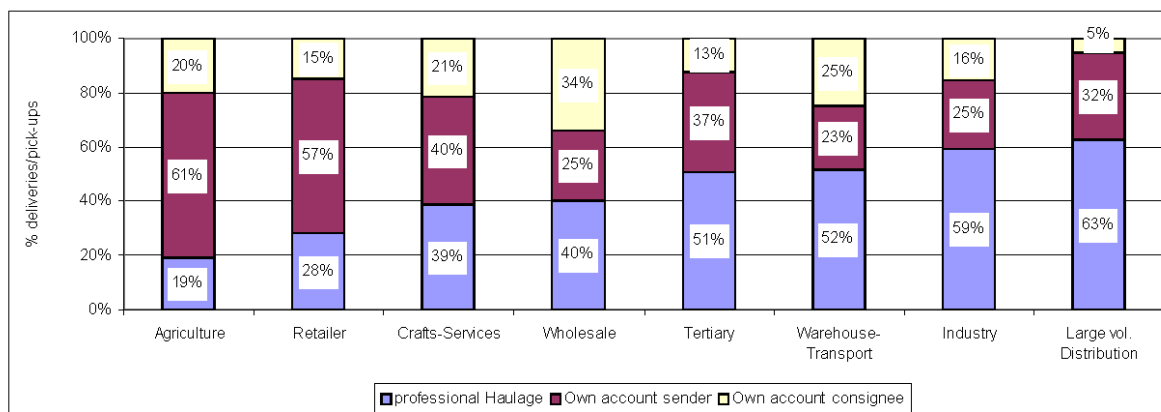
2.1. The use of own-account shipping is related to economic sector

To understand goods mobility in urban areas, one must decompose the urban economy into sectors, as each type of business generates a different volume of flows with different shipment frequencies. As Dablanc has observed (2007), within a business sector there is no real difference from city to city. From a logistic point of view, firms of the same size and sector will function almost identically in any city in France. The major differences appear from one sector to another. Knowledge of the interactions between freight activity and economic structure is essential to understand the mechanisms of urban freight transport (Ogden, 1992; Woudsma, 2001).

Differentiation by sector is also useful in explaining reliance on own-account shipping, as observed by Patier (2004) (Fig. 2). It is essentially retail, wholesale, the crafts, and services who rely on own-account shipping for more than half of their needs, and this figure can be as high as three fourths for small shops (Chiron-Augereau, 2009). These business sectors have specific needs in terms of reliability, and timing is essential. Because they are more service-oriented than industrial, they need to offer high-quality service or ensure proper reception of supplies (in the case of own-account consignee).

⁸ For methodological reasons, our calculations did not allow the inclusion of multipolar municipalities (those which are part of several urban areas). This would probably increase the proportion. Also, the scope of this survey did not take construction materials businesses into account, which are particularly strong users of own-account transport. Thus, the proportion of own-account shipments within a single urban area would be increased.

*How is own account transport well adapted to urban environments?
CRUZ, Cecilia*



Source: LET, "Urban Goods Transport" surveys, 1996-1999

Figure 2: Management of delivery operations by type of business.
Source: Patier, 2004

One explanation for the preponderance of own-account transport in urban areas is the location of its main users: in 2008, 83% of wholesale establishments were located in urban areas, whereas only 72% of industrial sites were located there⁹.

Some characteristics of own-account freight are explained by the types of business involved (wholesale and retail) which are more likely to carry out shipments in delivery runs. Own-account transport makes up 82% of multi-stop delivery runs carried out within a single urban area.

Business sector is the main factor explaining why a firm chooses one kind of organisation over the other. However, the geographic configuration of the city also affects the circulation of goods: for example, the existence of a bypass road may encourage use of own-account transport, as infrastructures of this kind can reduce trip time, and thereby reduce costs.

2.2. The role of density in own-account transport organisation

Urban freight varies according to a city's geographical areas. City centres concentrate a high density of freight movements: 5,000 to 30,000 deliveries and pick-ups per km² per week for European cities¹⁰.

According to Patier (2002) one third of a conurbation's pick-up or delivery operations occur in the hypercentre.¹¹ The structure and compactness of the urban context encourage the use of own-account transport, which is particularly present in dense urban areas. According to the ECHO survey, 72% of shipments carried out within a single urban hub are own-account. This observation is not limited to France: according to data from the Politecnico di Milano

⁹ Data: Sirene-INSEE

¹⁰ Data from Urban Freight surveys (Laboratoire d'Economie des Transports) Internet site : <http://www.transports-marchandises-en-ville.org>

¹¹ "The hypercentre is characterized by a historic centre with narrow streets, a strong concentration of employment, and mixed use, rarity of space which leads to growing land costs. (...) The concentration of independent or franchised shops leads to dense traffic." (Patier, 2002)

(2000)¹², 63% of deliveries and pick-ups in the centre of Milan are own-account. The proportion of own-account shipments is higher near the centre of cities: in a 2004 study on the Emilia-Romagna region (Bestufs, 2006) we see that the use of own-account transport decreases as geographic scope increases. Of all own-account shipments in this region, 51% are in the district of Bologna, 34% in the province of Bologna, and only 15% of own-account shipments are at the regional scale. Thus, own-account shipping is used more frequently in dense parts of the urban area; this fact is strongly related to the business sectors which manage their own shipping.

3. TIME: AN ESSENTIAL FACTOR FOR URBAN FREIGHT, AND A KEY ELEMENT IN THE ANALYSIS OF OWN-ACCOUNT TRANSPORT

3.1. Taking the client's needs into account: more reactivity and better service

Timing is essential in urban freight transport: the density of commercial activity and consumption amplifies the role of just-in-time (JIT) logistics, which are all the more valuable in that urban environments are close to consumers. Maximum delivery leadtime requested by clients can be a good indicator of JIT practices and requirements for tight control over freight transport. We observe shorter maximum delivery leadtime requested on own-account shipments: for wholesale own-account shipments within a single urban area, the mean was 1 day as opposed to 2.5 days for wholesale shipments carried out by third parties; for industry own-account shipments within a single urban area, the mean was less than 3 days as opposed to less than 32 days for industry shipments carried out by third parties¹³. This demonstrates that own-account shipments participate more in low time limit production systems, where clients expect rapid delivery or pick up their own orders, as in the case of the Rungis, a wholesale market for fruits, vegetables and agricultural produce in Paris Urban area.

For 50% of shipments of own-account transport, the maximum delivery leadtime requested is 24h versus 48h for third-party for all of activities. Reductions in shop inventory have repercussions on intermediate links (wholesalers), who serve as a buffer between industries reducing inventory and shops that wish to do likewise. Thus we observe that wholesalers who rely on own-account transport for their shipments within a single urban area retain more days of inventory: on average, 46 days as opposed to 22 days for those who use third party shipping. Intermediaries play an increased role in this fragmented production system (Guilbault, Gouvernal, 2010).

Transport reliability is a major issue for this kind of business. Thompson *et al.* (2001) remark that retail shops have a stronger need to be supplied (for example) with fresh products, which necessitates higher shipment frequencies, thereby increasing the number of deliveries

¹² Dablanc, L. (2004). Urban Freight Management in Large European Cities. Proceedings of the European Transport Conference.

¹³ Source : Data from ECHO Survey-INRETS, 2004

over restricted time windows. In fact, we observe that shipper-recipient relationships are stronger among wholesalers who use own-account delivery: on average the annual number of shipments sent between each origin/destination pair within a single urban area is 1086, versus 173 for wholesalers who use third-party shipping under the same conditions¹⁴. The median of the annual number of shipments sent between each origin/destination pair within a single urban area is 250 shipments annually for wholesalers using own-account shipping for the surveyed shipment, and 30 for wholesalers using third-party shipping¹⁵.

The difference between these two types of transport organisation increases with urban density: for shipments within a single urban hub, the average client requested a maximum delivery time of 1 day for wholesale shipments versus more than 3 days for third-party¹⁶. For industry own-account shipments, the average is less than 4 days, versus 54 days for third-party¹⁷. Spatial proximity is essential to satisfy this sort of demand. The figure helps us to understand this: the left part link the production with the time and the consequences in terms of uncertainty, the right part illustrates the phenomenon in spatial terms. As Rodrigue has shown (Fig. 3), while increasing the number of links in logistic chains may reduce the higher level of uncertainty and offer more proximity, it also implies an increase in inventory costs, as discussed above. Differences are also visible with increasing density on a given shipper-recipient link: for shipments within a single urban hub, the annual number of shipments is higher for wholesalers using own-account shipping (1260) than for those relying on third parties (217)¹⁸. The denser shipment links are, the more it is in a firm's best interest to carry out transport on its own account.

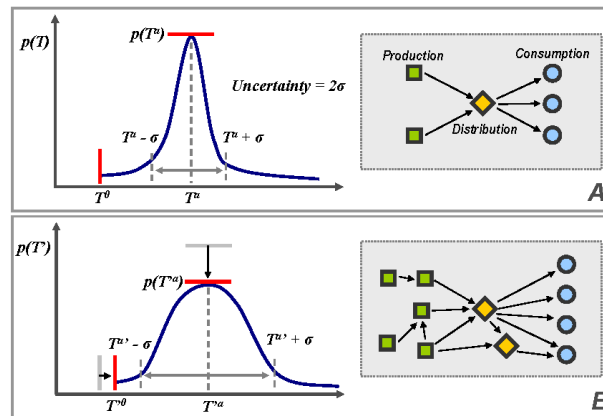


Figure 3: The complexity of a logistic chain and its effects on uncertainty. Source: Rodrigue, 2006

In own-account organisation, client relationships are important, but recipients may be more than just clients: for firms that use own-account transport for shipments within the same urban area, the share of shipments that are destined for other sites of the shipper's parent

¹⁴ Source : Data from ECHO Survey-INRETS, 2004

¹⁵ Source : Data from ECHO Survey-INRETS, 2004

¹⁶ Source : Data from ECHO Survey-INRETS, 2004

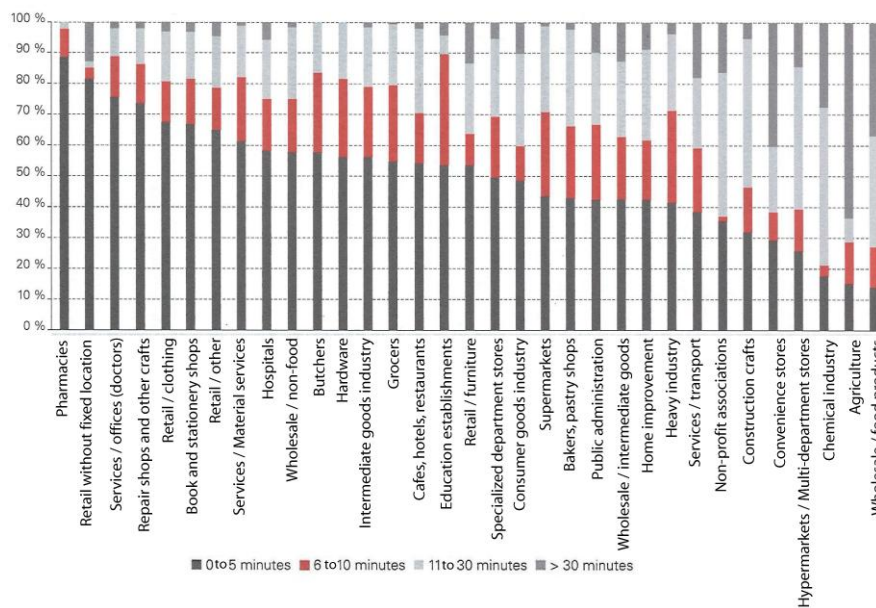
¹⁷ Source : Data from ECHO Survey-INRETS, 2004

¹⁸ Source : Data from ECHO Survey-INRETS, 2004

firm or group is 14% on average, as opposed to 19% for firms using third-party shipping. This demonstrates that own-account shipping is not preferred for intra-establishment exchanges within a firm or group.

3.2. Delivery schedules discourage mutualisation: two different ways to deliver

Figure 4 shows that unloading takes longer in the sectors that use own-account shipping most, except for very large retail centres whose high volumes lead to longer times. Users of own-account transport take their clients' specific expectations into account: for example, a manufactured products wholesaler may offer inventory storage, or a Parisian caterer might offer personalised delivery schedules and goods. Specialized service increases unloading time, which takes an average of 47 minutes for own-account shipments (direct trips carried out by vehicles less than 3.5 T Gross Vehicle Weight Rating) versus 26 minutes for third-party shipments of the same kind. For delivery runs with less than 30 stops, the average own-account unloading time was 13 minutes, versus 9 for third-party (Patier, 2004). This observation holds independent of vehicle dimensions: the gap between own-account and third-party unloading time persists for larger vehicles.



Source: LET, summary sheet for 3 surveys from the Goods Transport in Cities program, 1999

Figure 4: Unloading time according to business type. Source: Patier, 2002

Thus we see that own-account and third-party transport imply different ways of delivering due to special client requirements. This is also true from the perspective of delivery schedules. For example, drivers for a caterer in the Paris region start very early in the morning (5AM) and end their shift at around noon. At this point other drivers begin a second shift that ends at 8 PM. They may be called upon to carry out operations at unusual hours for special events. Considering the unusual schedules and trips involved, it is difficult to find a suitable third-party carrier.

How is own account transport well adapted to urban environments?
CRUZ, Cecilia

The delivery driver's job is unique. The maps in figures 5 through 8 represent delivery runs made by such drivers in urban environments. They are from the Transport and Goods in Cities surveys (TMV) carried out by the Transport Economy Laboratory (LET) in Bordeaux (1995) and Dijon and Marseilles (1997).

Figures 5 and 6 show the path of own-account delivery runs. These drivers work morning shifts: 7 to 9 AM for the meat delivery driver and 6 AM to 1 PM for the frozen foods distributor. The meat delivery points are scattered throughout the city, whereas the frozen foods deliveries are more concentrated toward the centre. This difference can be explained by the clients: kosher butchers are not very numerous and are dispersed throughout the urban area, whereas frozen foods retailers are also located throughout the city, but are distributed more evenly, which makes concentrated delivery runs possible.

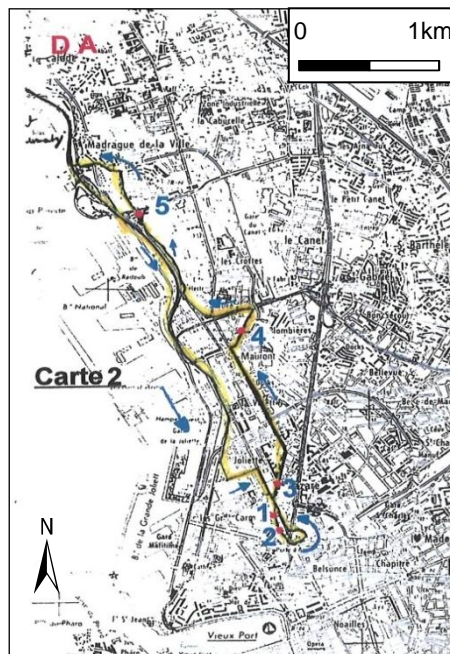


Figure 5: Path of a kosher meat delivery run in Marseilles (7-9 AM)¹⁹. Source: LET

¹⁹ The red points represent stops, whereas the numbers give the order in which the stops were made.

*How is own account transport well adapted to urban environments?
CRUZ, Cecilia*

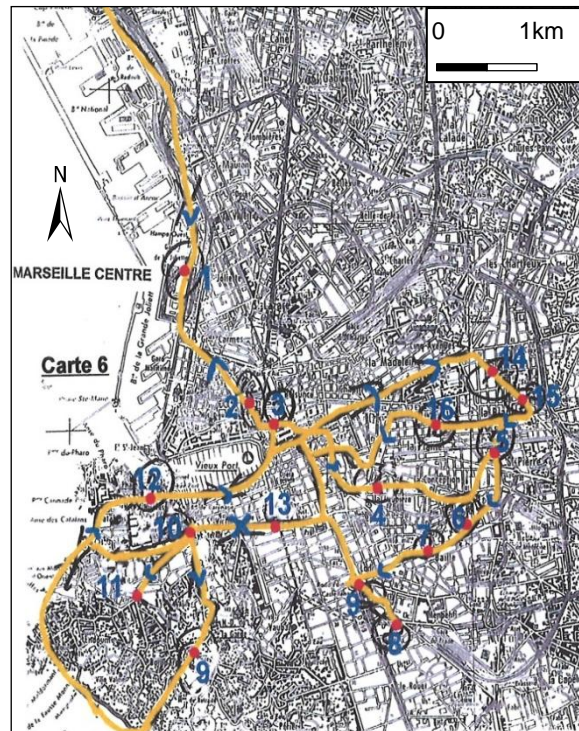


Figure 6: Delivery run by a frozen foods distributor in Marseilles (6 AM to 1:15 PM). Source: LET

Figures 7 and 8 show parcel delivery runs. They are more spatially concentrated than the own-account runs, in both the centre city and the industrial area. These runs begin later: around 8:30 AM in both cases. This illustrates the differences in schedule and spatial distribution of stops between own-account and third-party delivery.

Another point is that own-account transport is better adapted to certain business' schedules. For example, because a grocery wholesaler's delivery runs are done early in the morning,²⁰ it was more appropriate to opt for wholesale-specific labour restrictions than those of the transport industry. The 39-hour weekly limit fits the schedule, e.g. 5 AM to 12 noon with a half-hour break. Delivery drivers also rarely accumulate 4.5 hours²¹ of driving in one day - they drive a total of about 100 km around their origin.

²⁰ Interview with the transport manager of a grocery wholesaler, 6 May 2009.

²¹ Beyond 4.5 hours of driving, drivers are legally required to take a break of 15 minutes minimum.

*How is own account transport well adapted to urban environments?
CRUZ, Cecilia*

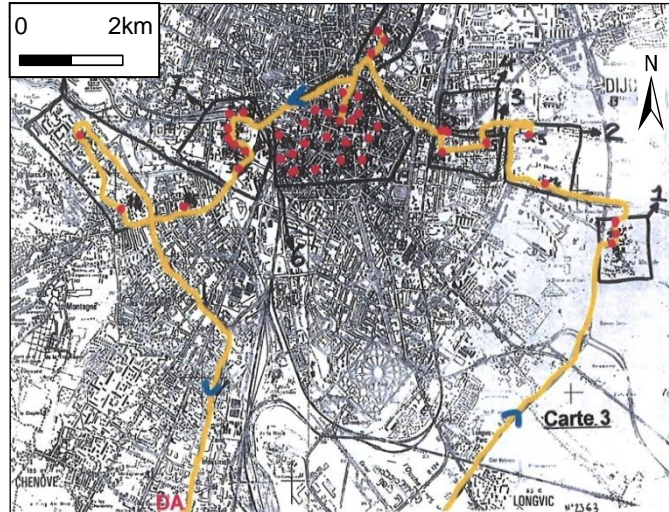


Figure 7: A parcel delivery driver's tour in Dijon (8:15AM-12PM). Source: LET

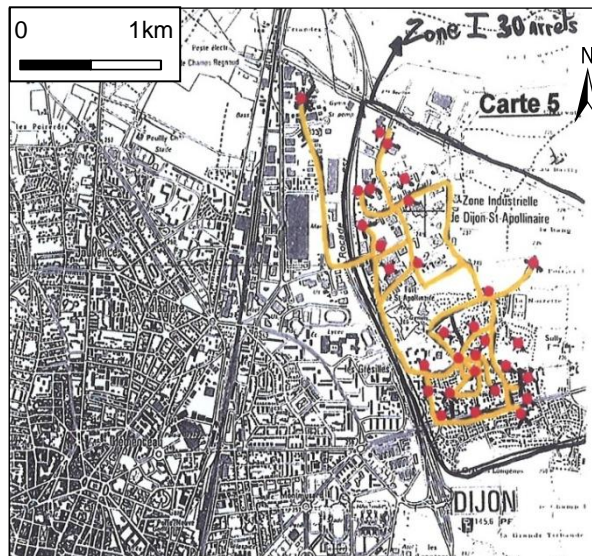


Figure 8: Parcel delivery tour in an industrial area in Dijon (8:30AM-12PM). Source: LET

Thus, working conditions for own-account and third-party delivery drivers differ. Own-account drivers are often given additional responsibilities beyond driving. During deliveries of wholesale intermediate goods, drivers are sometimes required to receive payment for the delivery, and even label merchandise. Drivers for construction materials wholesalers have a central role in expanding business, as they are responsible for spotting new construction sites during their deliveries. This information is passed on to sales staff, who then approach these potential new clients.

4. THE RELEVANCE OF OWN-ACCOUNT TRANSPORT USE BASED ON SHIPMENT FREQUENCY, TONNAGE, AND ACCESSIBILITY

Here we present a case study on a manufactured products wholesaler. The firm studied uses own-account transport in the Paris region (*Ile-de-France*), and occasionally in the neighbouring Oise *département* (deliveries to one municipality in 2007). It is important to note that this firm does not sell products which might require the use of specialised delivery equipment. Own-account transport is used for quality of service reasons. The firm considers client relationships to be essential, and provides the complementary service of storing merchandise after orders, delivering it whenever the client is ready. Own-account transport is justified by the desire to assure delivery within 24 hours. Rapidity is a way to stand out among the competition, and thus own-account delivery is a selling point.

30% of the firm's shipments are own-account. Until 2001, this shipper handled all of its own shipments within the Parisian region. Then, the business redefined the borders of its own-account service zone in order to reduce transport costs. We clearly see that the areas with the highest frequency of deliveries (up to 94 shipments per week) are those that continue to receive own-account service (Fig. 9 and 10). The spatial distribution of tonnage (map not presented here), is similar to that of delivery frequency. The own-account service zone was largely defined by the volume of merchandise delivered. The firm's market is essentially the Parisian region; in other French regions, volumes are less concentrated.

How is own account transport well adapted to urban environments?
CRUZ, Cecilia

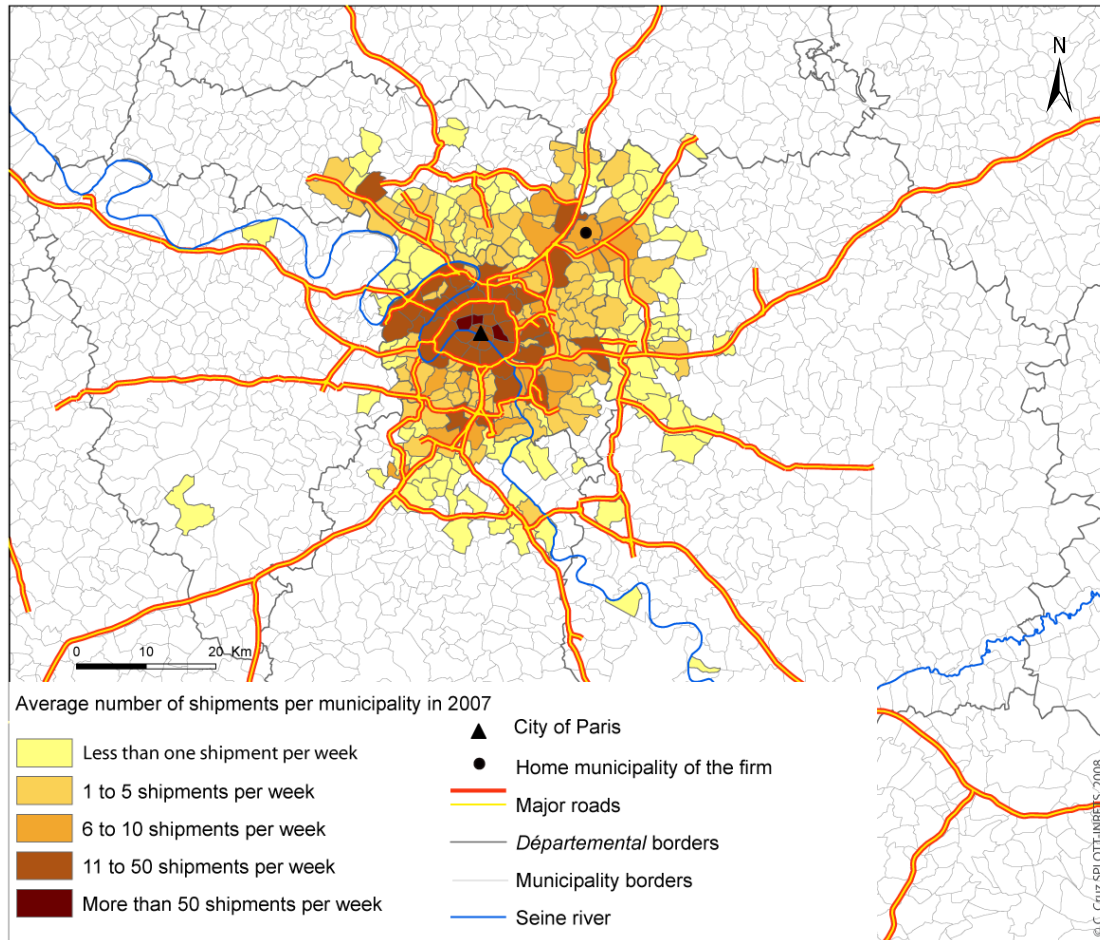


Figure 9: Distribution of own-account deliveries by a wholesaler in Ile-de-France in 2007.
Source: data from the firm

How is own account transport well adapted to urban environments?
CRUZ, Cecilia

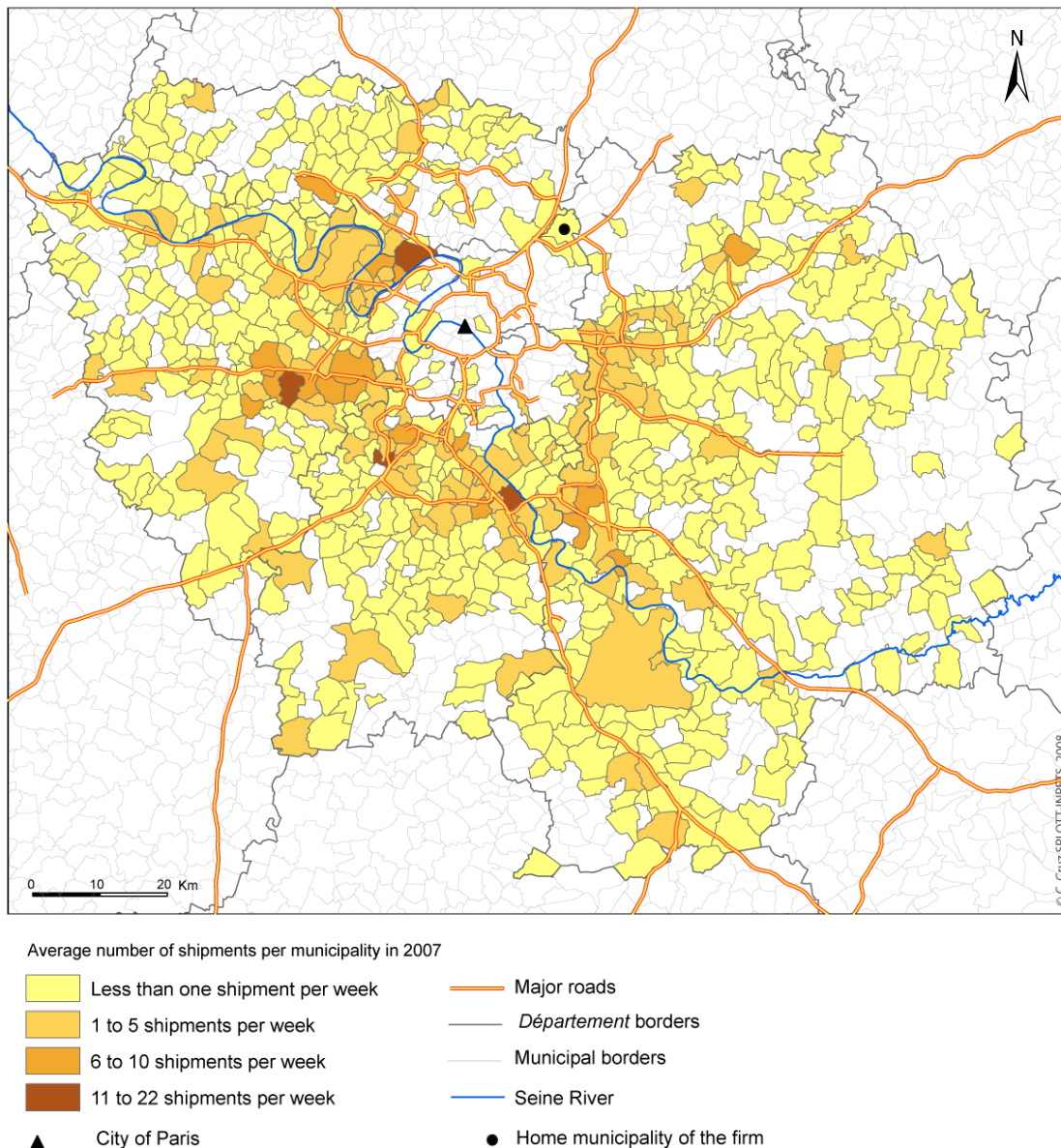


Figure 10: Distribution of third-party deliveries by a wholesaler in the Parisian region. Source: data from the firm

These maps illustrate the fact that shippers rationalize costs, and that own-account shipping is a conscious strategic choice, rather than a simple decision made without knowledge of the environment.

We have also analyzed all of this firm's shipments (both own-account and third-party) to municipalities in Ile-de-France. Three parameters which affect transport cost (frequency, tonnage, time accessibility) have been calculated for each municipality. As mentioned above, the entire zone is not served on an own-account basis because costs are too high. We have grouped different values for these parameters into four categories:

How is own account transport well adapted to urban environments?
CRUZ, Cecilia

- Category 1 (Own account service very relevant): Municipalities where the shipment frequency is high, tonnage is high, and time accessibility is good (defined as below 1.5 hours from the firm location). Own-account service is advantageous. Certain municipalities situated to the east but not currently in the own-account zone may be economically interesting. High delivery frequency and a location close to motorways allow a faster rotation of equipment and thus better profitability.
- Category 2 (Own account service relevant in terms of tonnage and time): Municipalities where tonnage is high and accessibility is good. Should be studied attentively, as heavy shipments may make service profitable.
- Category 3 (Own account service relevant in terms of tonnage or of time): Municipalities where either tonnage is high or accessibility is good. Own-account delivery is less advantageous.
- Category 4 (Own account service not relevant): Certain municipalities are located away from motorways and not relevant, as all shipment parameters for these locations are negative.

While adjustments could be made to the initial service zone (*cf.* Fig. 9), they are minor (*cf. supra* category 1).

How is own account transport well adapted to urban environments?
CRUZ, Cecilia

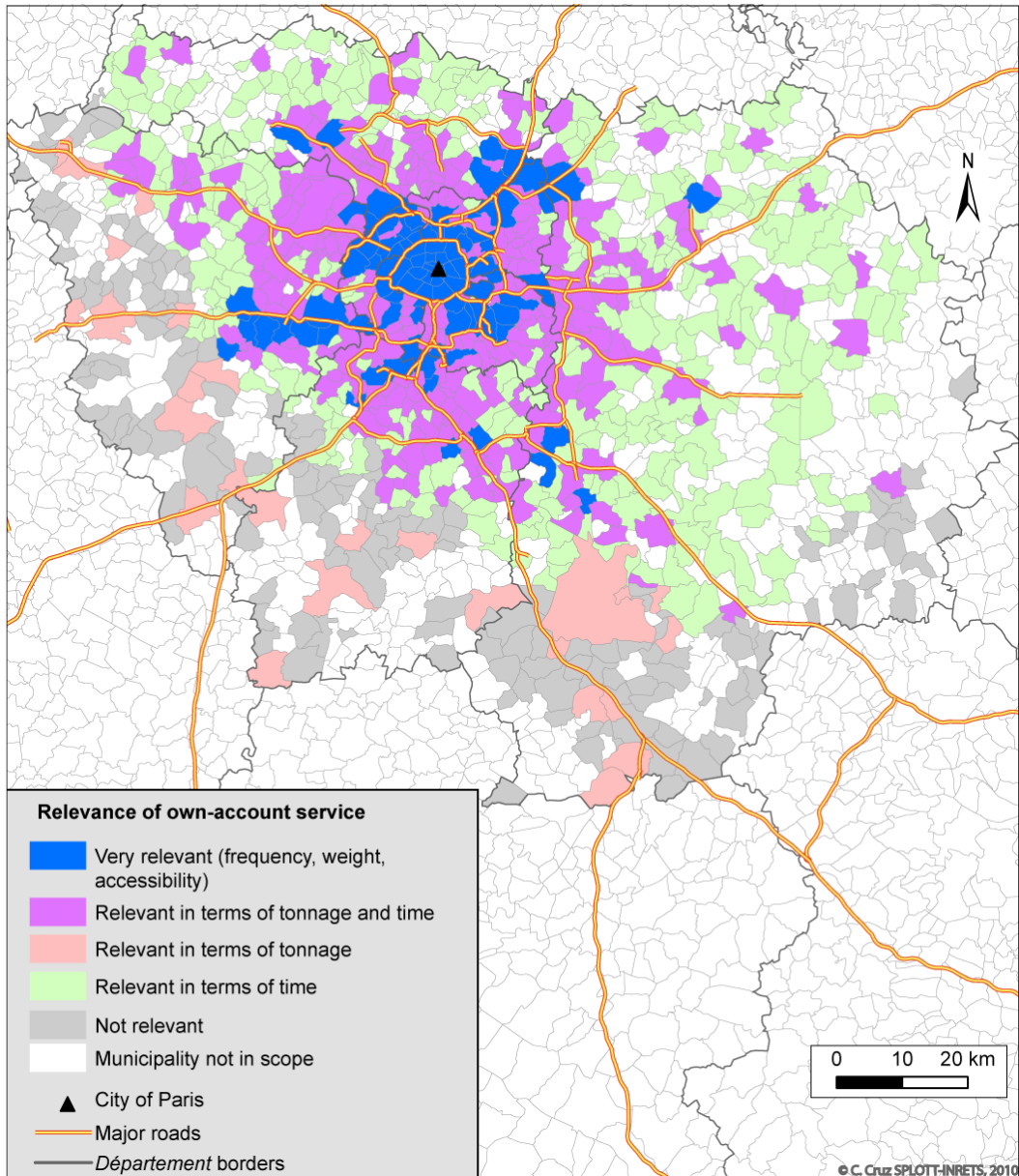


Figure 11: Relevance of service to municipalities in Ile-de-France. Source: data from the firm

This case study shows that the spatial distribution of own-account shipments is not uniform throughout an urban area, and that the density of clients (and thus of shipments) helps explain reliance on own-account transport.

5. REGULATORY CONSTRAINTS SLOW THE DEVELOPMENT OF SPECIALISED PROFESSIONAL CARRIERS

The implementation of goods transport policies lacks coherence in urban areas. Dablanç (1998) has shown that legal constraints in the Paris region are heterogeneous. Since 1996²² French urban areas must elaborate Urban Travel Plans (PDU) which include a section on freight. They are thus responsible for defining transport policy orientations. However, individual municipalities retain (police) power over vehicle traffic, and often take action which is not coherent with the urban area's general policy, or even neighbouring municipalities' traffic rules. Municipal ordinances often restrict access to heavy trucks. The resultant superposition of rules in the urban environment is not conducive to the emergence of service providers offering a true alternative to own-account transport.

It is interesting to note that the firm presented in the above case study records legal restrictions (such as vehicle size limitations) in their client database as soon as this information is known, which allows better delivery organisation. When the first delivery is made for a customer's first order, it is possible that the delivery vehicle is prohibited from using the street where the client is located. This system allows the firm to avoid repeating such errors. Knowledge of legal restrictions within the delivery area is necessary to optimise shipping and ensure high reliability of delivery times. Firms which rely on own-account shipping develop their own tools to increase efficiency and reduce the risk of additional transport costs.

Transport in urban environments is unique because activity is concentrated, causing specific problems. While this space is particularly susceptible to congestion problems, we have also seen that it requires the most reliable transport due to the large number of clients. Nonetheless, few large carriers handle their own deliveries in urban areas, and parcel delivery firms outsource service in major cities. These firms respond to the trend toward shipment fragmentation by grouping and degrouping small packages, and as most of their principal recipients are in urban environments, they contribute to the dominant role of subcontracting. Outsourcing certain links, particularly the final one, helps lower total transport cost and concentrate resources on activities that are more profitable than transport and logistics organisation. Research on outsourcing in urban environments (Cruz *et al.*, 2009) shows that this practice is common, and that external factors beyond carriers' control such as traffic congestion also play a role. As traffic conditions worsen, drivers' tours lengthen and firms find it safer to employ a sub-contractor. Under these conditions, it is difficult to assure personalized service for the clients who constitute the majority of their demand.

According to a report from Pipame (2009), a large share of fruit and vegetable distribution in Paris is own-account. Legal restrictions on the transport of fresh products impede delivery optimization. Different kinds of products (meat, cheese, fish, etc.) cannot be mixed during

²² With the LAURE law (Law on Air and the Rational Use of Energy), 30 December 1996.

transport²³. This study on Rungis Market underscores the lack of multi-compartment transport services. During our interviews, we encountered a case where a wholesale restaurant supplier using own-account transport was developing a multi-compartment vehicle to better solve this problem. This case shows that when transport supply does not respond to shippers' needs, they do not even consider outsourcing to be an option.

One French group called Star Service specifically deals with last-mile logistics for controlled-temperature perishable goods, and is diversifying its business through subsidiaries such as Toutadom, which delivers fully prepared meals. Nevertheless, this kind of large urban carrier is quite rare, with most outsourced flows handled by small organizations. Differences do exist between cities of different sizes and in different geographic locations. For example, cities that are subject to strong seasonal variations (such as those in the South of France) have high rates of outsourcing. The size of cities seems to be an influential variable (Cruz *et al.*, 2009; Raia, 2005).

The transport supply is essentially composed of single-employee businesses, and does not seem to be conducive to the externalisation of what are currently own-account shipments, considering the importance of reliability and the shipment timings required by own-account transport users. The difficult conditions in urban areas seem to make them less attractive for professional carriers, and the city may therefore be a privileged zone for own-account transport.

From a sustainable development perspective, it is appropriate to explore the possibility of mutualising own-account shipments even if it is unauthorized yet in own account transport. In France, as in other European countries, several urban logistic experiments have been carried out in an attempt to reduce flows in an urban area. The principle is to mutualise flows through a logistic platform. This allows savings on transport costs, but these savings are not sufficient to compensate for those imposed by additional transloading (Patier, 2002). A shift to this kind of platform would probably reduce quality of service and reactivity for own-account shippers, if we take the additional transport steps into account.

6. CONCLUSION

Own-account transport is used in urban environments because this is where its principal users (retailers) are often located. However, we find that density plays a role, and observe differing levels of use across urban areas. The case study presented here illustrates the role played by shipment density on the use of own-account transport. Own-account service is certainly advantageous at this scale due to inadequate supply of urban freight services. Spatial proximity is not the only relevant criterion for defining zones where own-account transport is advantageous, as time accessibility has a considerable effect in urban areas that experience significant congestion.

²³ National Transport Council, 2004, Programme national marchandises en ville et guide «*Une voirie pour tous*», Report on work by the "Road sharing" group.

Own-account shipping is a means for firms to ensure the reliability of their shipments; third parties' obligations to other clients can cause delays, and urban shipping requires rapidity. It is a tool firms use to manage complex urban logistics without increasing transport costs exponentially. For professional transport suppliers, short trips are also less profitable.

7. REFERENCES

- Bestufs (2006). Quantification of Urban Freight Transport Effects I.
- Chiron-Augereau, V. (2009). Du transport de marchandises en ville à la logistique urbaine, quels rôles pour un opérateur de transports publics urbains ? Le cas de la RATP. Phd. Dissertation University Paris-Est – France
- Cruz, C., Raia, A., Dablanc L., (2009). Sous-traitance de la messagerie urbaine : quelques spécificités spatiales, unpublished.
- Cruz, C., Zembri, P. (2009). La région, échelle de pertinence du transport pour compte propre en France : état des lieux et éclairages par les caractéristiques du service de transport. *Les Cahiers scientifiques du transport*, 56, 137-155.
- Dablanc, L., (1998). Transports de marchandises en ville, une gestion publique entre police et services. Liaisons, Paris.
- Dablanc, L. (2004). Urban Freight Management in Large European Cities. Proceedings of European Transport Conference.
- Guilbault, M.; Gouvernal E., (2010). Demand for transport and production systems – shipper surveys in France in 1988 and 2004. Transport Research Board Conference 89th Annual Meeting, January 10-14, Washington.
- Hesse, M.; Rodrigue, J. (2004). The transport geography of logistics and freight distribution. *Journal of transport geography*, Vol. 12, 3, 171-184.
- Moriconi-Ebrard F. (1994). Geopolis, Pour comparer les villes du monde. Anthropos, Paris.
- Ogden, K. W. (1992). Urban Goods Movement: A Guide to Policy and Planning. Aldershot, Ashgate.
- National Transport Council (2004). Programme national marchandises en ville.
- Patier, D. (2002). La logistique dans la ville. Celse, Paris.
- Patier, D. (2004). The part of own account transport in urban logistics. 10th World Conference Transport Research, July 4-8, Istanbul-Turkey.
- PIPAME (2009). La logistique mutualisée : la filière « fruits et légumes » du Marché d'Intérêt National de Rungis, PIPAME.
- Rodrigue J.P. (2006). Transportation and the Geographical and Functional Integration of Global Production Networks. *Growth and Change*. Vol. 37, 4, 510-525.
- Raia A. (2005). La sous-traitance dans le transport de marchandises en ville : acteurs, déterminants, spécificités selon les villes. University of Paris XII – Institut d'Urbanisme de Paris, ENPC. Unpublished.
- Thompson R.G.; Taniguchi E. (2001). Chapter 25 City logistics and freight transport. *Handbook of Logistics and Supply Chain Management*. Brewer, A.M. (eds.), pp. 393-405. Elsevier.
- Woudsma C. (2001). Understanding the Movement of Goods, Not People: Issues, Evidence and Potential. *Urban studies*, Vol. 38, 13, 2439-2455.