The Rise of On-Demand 'Instant Deliveries' in European Cities

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Forthcoming in Supply Chain Forum – an International Journal

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Abstract

This exploratory paper contributes to a new body of research that investigates the potential of digital market places to disrupt transport and mobility services. We are specifically looking at the urban freight sector, where numerous app-based services have emerged in recent years. The paper specifically looks at 'instant deliveries,' i.e. services providing on-demand delivery within two hours – by either private individuals, independent contractors, or employees – by connecting consignors, couriers and consignees via a digital platform. The paper provides an overview of the main issues concerning instant deliveries, supported by data (including a survey of 96 courier delivery providers) and examples. After presenting a typology of companies (digital platforms) involved in 'instant deliveries,' we question in what way they transform the urban freight current patterns. We highlight four issues, discussing their potential to impact urban freight services and related policies in European cities: 1) Freight trips and data; 2) Business models; 3) Labor legislation and work conditions; and 4) Local public policies. We conclude by saying that predicting the medium-term consequences of these changes is difficult, but it is essential that city planning and policies take account of these developments and consider how planning and possibly regulation needs to be adapted to these new ways of doing things.

Keywords

Instant delivery, urban freight, urban logistics, on-demand delivery, crowd sourcing, crowd shipping.

Achnowledgments

This research was carried out thanks to the financial support of the Visiting Professor Programme of the School of Business, Economics and Law from the University of Gothenburg as well as the Metrofreight/VREF Centre of Excellence.

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Introduction

This paper contributes to a new body of research that investigates the potential of digital market places to disrupt transport and mobility services. We are specifically looking at the urban freight sector, where numerous app-based services have emerged in recent years.

The urban mobility environment has been transformed by on demand transport services based on smart phone apps like Uber and Blablacar, which now represent reliable and cheap alternatives to traditional passenger transport services. Disruptive innovations of this type are expected to reshape the urban freight transport sector as well, potentially improving the rather under optimized segment of last mile deliveries. These new services include large companies (UberRush, Amazon Prime Now) together with start-ups (Deliveroo which started in the UK, Foodora in Germany, Cocolis in France, Baghitch in Sweden for example). Some of these new services are identified as "instant deliveries," as they correspond to a growing market segment where consumers or companies buying online expect to get delivery within less than one or two hours. By increasing the supply of options for deliveries of parcels and other products, and providing matching services, digital market places can contribute to defining new products and services. They are also expected to generate an array of impacts, some positive and others negative.

This paper is exploratory and provides an overview of the main issues concerning instant deliveries supported by data and examples. We question, for these issues, in what way instant deliveries transform the urban freight current patterns. In the second section, we propose a definition and present our methodology. Then, we present a typology of companies (digital platforms) involved. In the four sections following, we highlight four issues and impacts related to urban freight, discussing their potential to disrupt urban freight services and related policies in European cities: 1) Freight trips and data; 2) Business models; 3) Labor legislation and work conditions; and 4) Local public policies. We provide a conclusion in the last section.

What are instant deliveries?

Proposed definition

Courier services within cities have always existed (orders to troops defending the city, and more recently pizza at night and urgent documents from office to office). What makes them special today is that e-commerce is a fully established activity and customer demands are becoming more sophisticated. This often means a fast delivery at a low price or for free. The technology, including smartphone apps and tools for crowd sourcing, enables the provision of another type of delivery service. The improved match-making between supply and demand facilitates the use of spare transport capacity and new sets of providers also on short distances with little time available. Considering this new context, we propose the following definition: "Instant delivery services provide on-demand delivery within two hours – by either private individuals, independent contractors, or employees – by connecting consignors, couriers and consignees via a digital platform." In this definition, we emphasize the limited timeframe between an order and a home delivery (or a delivery on a workplace or any other place), as well as the use of distributed data accessed with a standardized and widespread technology. Currently, this means using a smartphone app. We use the term "instant" in a similar way as McKinnon (2015), emphasizing the increasing need for "instant gratification" of the urban consumer. Within instant delivery services, business to consumer (B2C) deliveries are dominant but not exclusive, as will be seen further on.

In business circles or in the technical and scientific literature (see below), several other names are applied to these types of deliveries: on demand deliveries, on demand logistics, rush deliveries, flexible goods deliveries, flexible transport services, peer-to-peer (P2P) logistics and courier network services. We find terms including "on demand" unsuitable since it implies that deliveries are also made on speculation or just for fun. Another popular set of names, 'crowd-sourced deliveries,' 'collaborative deliveries', or 'crowd-shipping,' has been used in two of the few scientific articles on the topic (Rougès and Montreuil, 2014, Stathopoulos *et al.*, 2016). To us, crowd-sourced deliveries

rather represent a subcategory of instant deliveries, mainly occasional deliveries made by private individuals using the available capacity they have when using their own means of transportation (bicycle or private car). Defined as such, crowd-sourced deliveries are rare (we develop the example of DHL service MyWays below), while instant deliveries in general are developing at a rapid rate. We however acknowledge that there is a wider use of the term crowd-sourced deliveries, representing a concept close to instant deliveries or on demand deliveries. In a recent note (Schmid-Drüner, 2016) (not specifically on delivery jobs), the European Parliament assimilates "sharing economy," "platform economy," and "gig economy." To us, the use of the term crowd-sourced delivery puts more emphasis on the supply of transport (cyclists or private car users as resources to supply delivery services) rather than on the demand side (consumers requesting instant delivery service).

Despite their recent history, instant delivery services have already met with numerous ups and downs. The business landscape is evolving very rapidly. As an example, eBay Now, a precursor (it started in US cities in 2013), was stopped in December 2014: "*Buying online and picking up in store for free is what the eBay shopper wants, not paying for the delivery*" (eBay CEO, 2014). In Europe, TakeEatEasy, by going bankrupt in a rather abrupt way (July 2016, see below), started to raise the general public's attention about instant delivery services, specifically their impacts on the job market and working conditions.

Instant deliveries in the literature

Although much research has already been carried out on online shopping behaviors and their impact on delivery activities in urban areas,[2] very little literature has been published yet on instant deliveries *per se*. There is an emerging flow of students' works: Briffaz and Darvey (2016), Vétois (2016), Saïdi (2017). A report from the Federal Highway Administration (Shaheen *et al.*, 2016) about "shared mobility" integrates goods deliveries into the discussion about new forms of urban mobility in the following way:

> Shared mobility- the shared use of a vehicle, bicycle, or other mode - is an innovative transportation strategy that enables users to gain short-term access to transportation modes on an as-needed basis (…). In addition to these innovative travel modes, new ways of transporting and delivering goods are also emerging. These courier network services have the potential to change the nature of the package and food delivery industry, as well as the broader transportation network (Shaheen *et al.*, 2016, p. 2).

The report also mentions that "courier network services provide for-hire delivery services for monetary compensation via an online application or platform to connect couriers using their personal vehicles, bicycles, or scooters with freight (e.g., food, packages)." Shaheen *et al.* (2016) distinguish two models: "Peer to peer delivery services[3]" and "paired on-demand courier services," and describe some of these services, mainly from the US (Postmates, UberEATS), emphasizing those related to food. The report insists on how these freight and passenger new mobility services encourage "last minute planning and on-demand or instant modal and delivery selections."

A 2016 International Transport Forum study (OECD/ITF, 2016a) addresses regulatory issues related to apps for passenger transport, not including deliveries. Another report (OECD/ITF, 2016b) calculates the potential impact on passenger mobility in case app services develop fast, but does not cover delivery services either.

As Shaheen *et al*. (2016), Briffaz and Darvey (2016) also include instant deliveries within the larger set of the sharing economy. They explore crowd-sourced delivery and compare different cases

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[2] De Koster for example (2002) explored organizational issues for the fulfillment of on-line customer orders in the food retailing sector. Boyer et al (2009) investigated delivery efficiency focusing on customer density and delivery windows.

[3] Shaheen *et al.* (2016) define them in the following way: "Peer-to-Peer (P2P) Delivery Services: A CNS [Courier Network Services] where anyone who signs up can use their private vehicle or bike to conduct a delivery." They include crowd-shared deliveries (a rare form of instant delivery services) as well as services using self employed private individuals signing up (a very common form of instant delivery services today).

corresponding to different business models. They investigate how stakeholders see the usefulness of crowd-sourced deliveries to solve some of the urban problems of Geneva, in Switzerland, and identify a rather high willingness of residents to use as well as supply crowd sourced deliveries. The authors' overview of the literature provides an interesting source (Fung Business Intelligence Centre, 2015), a Hong Kong think tank about crowd-sourced deliveries in China.

Rougès and Montreuil (2014) date the "burst" of crowd sourcing deliveries to two years prior to their research, i.e. 2012. They mention several players, some of which have confirmed their growth today (2017), such as Postmates in the US and Deliveroo in Europe, while others (MyWays, by DHL, see below, or eBay Shutl service) have not. They identify and analyze 26 services, most of them from the US, and emphasize the gains that these services provide (speed, price, delivery flexibility, work schedule flexibility, optimization of resources and reduced carbon footprint). They look at how the Physical Internet concept applied to crowd-sourced deliveries could enhance the gains. Stathopoulos *et al*. (2016) look at operational performance and make a behavioral analysis of crowd-sourced deliveries in the U.S. Their objective is to contribute to the analyses that compare the "promise" of crowd-shipping related to a better use of resources against its potential "rebound effects" such as increased travel and fuel consumption.

Methodology

Our paper relies on an extensive data collection. Primary sources were made from a survey (face to face interviews) with 96 instant delivery workers in Paris (Saidi, 2017). Details on the sample of interviewees are provided below. The questionnaire contained 32 items covering three categories of questions: the worker's personal situation (age, training, place of living); the facts of the job (which company, how many hours, what revenue); and the worker's perception of the job's benefits and challenges. We carried out four additional interviews with instant delivery company managers in France and Sweden. Secondary sources were business journals (in the transport, freight and supply chain areas) and the economic or generalist press, as well as company websites. Specifically, we made an analysis of a selection of 40 digital platforms whose websites and blogs were scanned extensively (including terms of service).

Companies providing digital platforms for instant deliveries

The analysis of data gathered online from 40 digital platforms operating instant delivery services is summarized in this section (the related table is presented in Appendix 1), followed by a focus on the food ordering and delivery market, which is the dominant sector (in the number of companies involved) at the moment.

Main characteristics

Among the wide range of key players, we observe the rise of online (digital) platforms and related smartphone apps, which act as a facilitator (or broker) of the relationship between retailers, couriers and private or commercial receivers. Less common, but emerging fast, are social networks offering messaging apps for delivery requests, such as the "Start Order" service on Facebook's profile for restaurants. Google recently announced a deal with a number of U.S. players letting users order meals for delivery straight from the search results. Another similar initiative has been created by Yelp, with the Eat24 business service. Software companies also play a role in impacting delivery practices through their order and delivery management apps designed specifically for retailers and businesses (and invisible to consumers), such as DeliveryCube in the UK and ChowNow or Tookan in the US.

In the late 2000s and early 2010s, various online platforms were created with the aim of providing effective matching between available couriers and delivery requests, in addition to optimizing logistics operations. One early initiative, Postmates, began in California in 2011 and currently operates a fleet of 20,000 self-contractors across the Unites States, offering a wide range of products, from prepared meals to consumer goods. At present, initiatives are created in various urban logistics chains, including: grocery and fresh food, prepared meals, consumer goods, alcohol, and laundry services.

Most of the selected instant delivery companies define themselves as technology platforms that connect users and businesses with private independent contractors or third-party providers for

collection and delivery services. Emphasis is given to their role as an intermediary. Companies like Box2Home (France) describe their position as neither a logistics provider nor a freight forwarder, as seen in their terms of service. Their service usually includes an electronic contract agreed to by all parties involved covering transaction options. Mediation between the parties is typically not offered and liability is either very limited or absent.

The P2P crowd-shared sector is sparsely populated. These initiatives recruit private individuals to provide delivery services intermittently, e.g. MyWays by DHL or Baghitch. They represent a very limited amount of deliveries. More common are the platforms for professional courier network services, which mainly recruit couriers acting in a professional capacity, either as self-employed (e.g. Deliveroo, Postmates, UberEats) or as licensed transport companies (e.g. Trusk, or Top Chrono in Paris working for Amazon Prime Now), requesting a regular service and minimum acceptance rates. As a result, self -employed couriers using their own vehicle (bicycles, cars or vans) at their own expense and risk are the dominant workforce behind instant deliveries.

Limited data are available about supply and demand for deliveries. Few platforms provide publicly available accurate data on the number of deliveries and description of the recruited fleet. Generic information is provided in websites, as for example Foodora, advertising – maybe misleadingly as the number seems rather low - a fleet of 750 courier cyclists (or "riders" as they are commonly named) across Europe. In general, transparency is missing about the pricing criteria and related algorithms for standard deliveries and peak-hours. Most often, platforms report in generic terms that delivery prices result from elements such as distance, timing, weight and volume for bulky goods, etc., without sharing details about pricing and surge multipliers.

TakeEatEasy is a good example of our sample. The company provided rather substantial data on its operations. We also present it here as it went bankrupt in July 2016 and is a good example of business model challenges. TakeEatEasy was focused on restaurant food, providing a direct link to customers, not owning any logistics asset (such as vehicles or logistics facilities), contracting with self-employed couriers. TakeEatEasy was created in 2013 in Belgium, and developed in European cities: in 2016, it had 160 employees, used a pool of about 3000 couriers, had signed up with 3200 partner restaurants, and had 350,000 customers in 20 cities in Europe (including Brussels and two other cities in Belgium, 12 in France, Berlin, London, and three Spanish cities). Its main competitors in Europe were Deliveroo (UK), Foodora (Germany), UberEATS (US). Just before bankruptcy, it made 150,000 deliveries a month, including 60,000 in Paris, its largest market (Roose, 2016).

The food ordering and delivery market

Ordering on line for food and prepared meals is becoming increasingly popular in Europe (eMarketer, 2016) and in the US (NPD, 2016). In 2010, approximately 1.39 billion phone delivery orders were placed in the US. By May 2015, that number had dropped to about 1.02 billion. In the same period, online orders more than doubled from approximately 403 million to nearly 904 million (NPD, 2016).

Historically, food delivery services were limited to some local grocery stores and to pizza or Asian restaurants. The emergent instant delivery initiatives extend consumers' options to a larger range of products, including premium restaurants and high-quality ingredients. The resulting ordering options can be classified in three categories: meal kit delivery with recipes and pre-portioned ingredients (like Blue Apron or HelloFresh); prepared food delivery (like Munchery or Deliveroo); grocery and alcohol delivery, including farm-to-table and grocery subscriptions (this category includes Instacart and Gousto).

At a global level, "food tech" funding increased steadily: from 2012 to 2015, there were 273 deals totaling over $5.6bn (CB insight, 2016). Between 2011 and 2014, 39 US-based private companies entered the sector of delivering either prepared meals or pre-portioned ingredients (CB insight 2016). In Europe, between 2010 and 2015, the western European market for takeaway and delivery grew 2.2 per cent, to £18.4 bn while the value of food bought in restaurants fell by 7.6 per cent to £135.3bn (€158 bn, FT 2016 quoting Euromonitor).

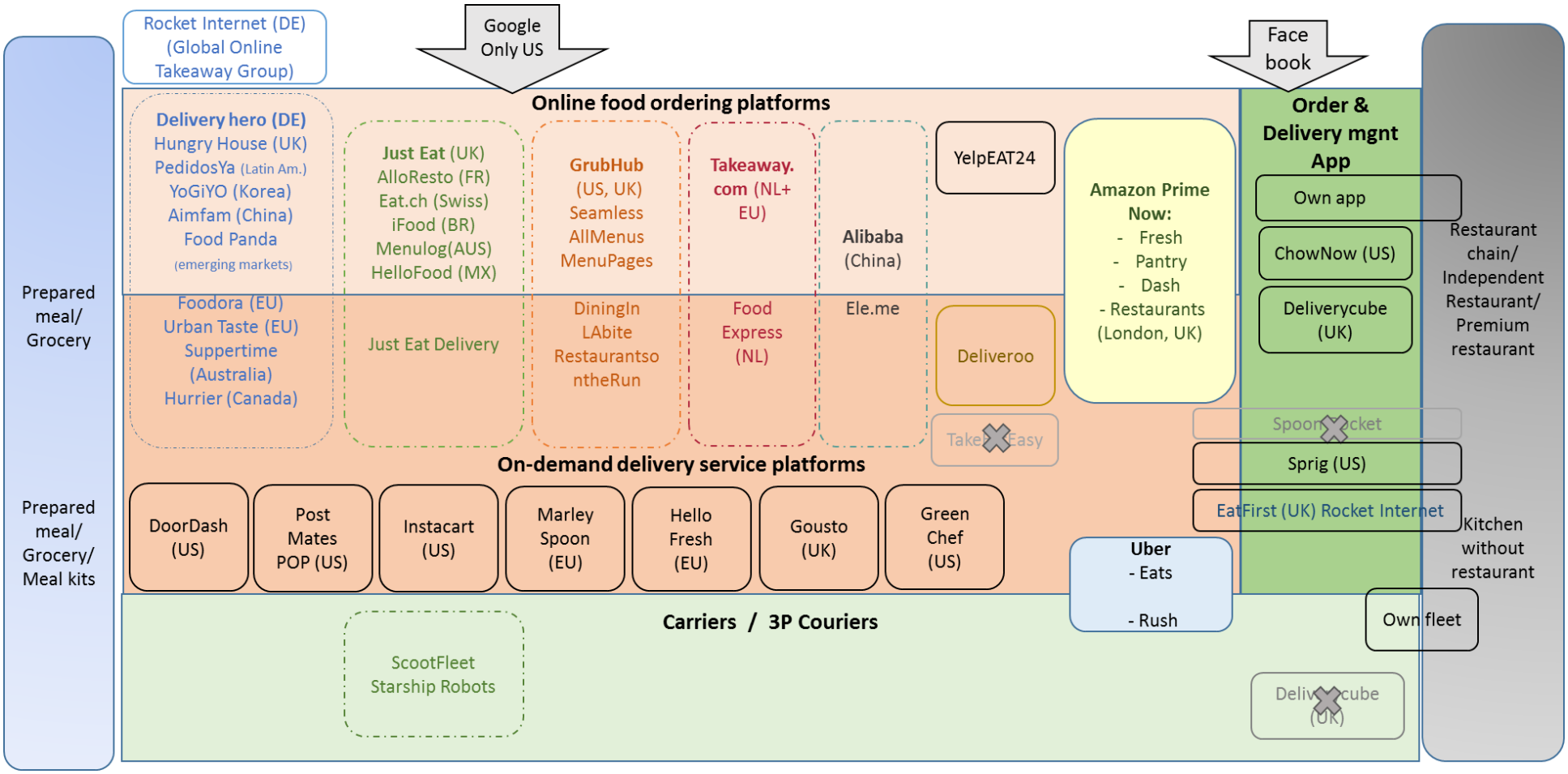
The resulting food delivery market is highly fragmented and dynamic, featuring consolidation processes by large international players to absorb startups and aggregators with a local consumer base.

An attempt to depict some of the main business networks at an international level is provided in Figure 1. According to our analysis, two main categories of businesses can be distinguished: the first includes online food ordering platforms, which are digital marketplaces mainly for takeaway restaurants. International platforms like UK's Just Eat, Germany's Delivery Hero and The Netherlands' Takeaway.com are Europe's biggest players active in other continents with affiliated brands. These companies did not manage their own fleets of delivery drivers, but provide online ordering to food businesses that already have delivery teams of their own.

The second category consists of instant delivery service platforms, e.g. software and logistics companies, which enable restaurants and take-outs to offer delivery without employing their own drivers and including various channels for food orders. Ordering and delivery operations are outsourced to companies like Deliveroo, launched in 2013 in London, and US-based UberEats, which developed their own in-house technology. Meals are ordered online through the platform and are delivered by e.g. UberEats or Deliveroo's team of drivers and cyclists in an average of 30 minutes. Within the same category are startups which deliver pre-proportioned meals, e.g. the French-based FoodChéri.

More recently, the two categories are experiencing a hybridization process, combining ordering and delivery services. In many cases, the recent trend for ordering companies has been to expand their scope and to acquire delivery platforms (e.g. Foodora acquired by Delivery Hero) or subcontracting delivery fleets (e.g. Just Eat partnered with Starship Technologies for robots and with ScootFleet for scooters).

Figure 1. The online food ordering and delivery market



Instant deliveries and urban freight data

One of our objectives with this research is to provide ground data on instant deliveries and instant delivery traffic in urban areas. At the start of our work, we found no data, not even basic or reconstructed from simulation or modeling, on the number of instant delivery service companies and the number of deliveries they provide. Consolidating data could provide the basis for further analyses on the impact of instant deliveries on urban traffic and congestion and on urban freight carbon footprint. For the purpose of this paper, we only made a preliminary quantitative assessment of the importance of instant deliveries within urban freight trips. We used the case of the Paris metropolitan area because of two recent urban freight surveys there, making it easier to compare instant deliveries to urban freight in general. One of these surveys is an extensive data collection on deliveries and pick-ups generated by business establishments[4] in the Paris region (Routhier, 2014). The other survey is about B2C e-commerce and e-commerce delivery trips in the Paris region (Delaporte *et al*., 2016).

The Paris urban freight survey of 2012-2014 (Routhier, 2014), found that there are 4,260,000 deliveries and pick-ups related to business establishments every week in the Paris region. To these, B2C related deliveries need to be added. According to our estimation, they amount to about 1.7 million deliveries and pick-ups per week in the Paris region.[5]

As for instant deliveries, we reconstructed, from activity data provided in our interviews with companies or in the companies' websites, and with companies' estimated market shares, the total number of instant deliveries in Paris. We estimated that number to be, at the date of June 2016, equivalent to a total of 100,000 instant deliveries per week, which also means that there are 100,000 pick-ups in the same area, as instant deliveries generally require a physical proximity between pick-up and delivery places.

This means that there are 0.2 instant deliveries per home per week made in Paris. According to our estimations, therefore, instant deliveries could represent in 2016 about 12% of B2C related deliveries and pick-ups, and 2.5% of total deliveries and pick-ups in the Paris region. The main conclusion from this preliminary evaluation is that freight trips generated by instant deliveries are rather significant already.

From our interviews with courier workers in Paris (see below the description of the survey), the transport modes for instant deliveries could also be identified. Deliveries were made by bicycle (88%), by motorbike and scooter (9%), by other means (pedestrian/roller blades + transit, cargocycles) (3%). This is very different from urban freight in the Paris region in general, where 57% of deliveries are by vans, 39% by lorries, 3% by motorbikes, and 1% by bicycles and cargocycles (Routhier, 2014). This heavy use of bicycles in Paris, and the fact no car nor van are used for instant deliveries, is probably an extreme case due to the French legislation on third party freight transport: any head of a company, or self-employed individual, providing a freight transport service with use of a motor vehicle (including scooters, motorbikes and vans) must be registered in the national freight transport register. This can be done after several days of training, the guarantee of a fixed sum on a bank account for each vehicle used, and a clean police record, have been secured. This rather strict legislation inhibits independent couriers from using motor vehicles, although many violations of the rule have been observed (with a

[4] An establishment, in economics statistics, is defined as a place of business or activity (such as an administration or a school). A company can have several establishments. A commercial building can hold several establishments (multiple office business tenants for example) or just one (a factory, a store).

[5] To estimate this, we used the average number of parcels related to e-commerce delivered in France (7 per person per year in 2015 according to FEVAD). This represents 84 million parcels per year in the Paris region, or 1,615,000 parcels per week. We estimated this to be equivalent to 1,615,000 *deliveries* per week (several parcels can be delivered in a single shipment but this is unusual). The number of pick-ups related to B2C is not included, as most B2C parcel pick-ups made within the Paris region are already accounted for within the establishment-based urban freight survey (Routhier, 2014).

rate of 9% of couriers using scooters or motorbikes, as seen above).

Business models

There are different classifications of business models used for instant deliveries in the literature. In an exploratory and pragmatic study, Carbone and Roussat (2015) divide the business models in four categories, based on whether the logistics is centralized or not and whether logistics is the purpose of the collaboration or a mere support. Rougès and Montreuil (2014) propose a different categorization with five business models, namely a Courier, Intendant, Intra-urban, National, and Social delivery. They observe that the B2C Intra-urban model is the dominant business model for instant deliveries, which also at the moment gets the most funding.

Many instant delivery initiatives partner with retailers or restaurants and operate in very dense urban areas. An important element of business models, as seen above, is the powerful collaborative platforms that offer real-time updates of supply and demand.

Built on the proposed framework in Rougès and Montreuil (2014), and to better understand the challenges and success factors of business models, we analyze the potential gains and pains of instant deliveries and crowd shipping for the different actors involved (i.e. customers, digital companies, retailers, and society).

Potential gains or pains for customers and users

One gets better economies of scale and shorter lead times in a crowd sourced delivery model. This is because the availability of potential carriers in these models far exceeds that of a delivery company that perhaps makes one milk run tour a day with each vehicle. According to Laucirica (2016), a shorter lead-time can be a competitive advantage especially for startups. In a survey, Lukic *et al.* (2013) demonstrated that free delivery, lower prices, free returns, online delivery tracking, security, options to specify delivery windows, and text alerts when delivery is nearby, are all more important to consumers than same day delivery[6]. Thus, they argued that same day delivery (and even more so instant deliveries for the same matter) might be a niche offering and not constitute a big enough market share to reach critical mass. This is an important question for instant deliveries' business model. As we argue in this article, it may start to be answered through the rapid increase in instant deliveries since the time of the survey by Lukic *et al*. (2013).

Profitability and access to investors' funding

Profitability is a major issue in instant delivery business models, and mostly depends on logistics optimization. As TakeEatEasy CEO said,

> Take Eat Easy's business model is fairly simple. On each order, we charge the restaurant a 25-30% commission, and a 2,5€ delivery fee to the customer. With this circa 10€ of net revenue per order, we then have to pay the bicycle courier. Contribution Margin is thus a function of Restaurant Commission, Average Order Value, Delivery Fee and Delivery Cost. The first three parameters are mostly dictated by market conditions. Delivery Cost, however, is a direct function of "Courier Utilisation", the number of deliveries per courier per hour. Courier utilisation is one of the most important metrics in our business (…). (Roose, 2016).

The price asked for an instant delivery service has been decreasing. Amazon Prime Now is even offered free of charge (within an annual membership in the Premium service, and for its two-hour delivery service). However, while delivery prices are decreasing, delivery costs are not. Some companies find it difficult to fit into this general market situation. For example, as referenced in Manjou (2016), Instacart revenue grew six-fold in 2015. But the increased revenue from its retail partners could not offset costs. As a consequence, Instacart, against what consumers want, had to raise delivery charges (to $6/5,6€ from $4/3,7€) for most orders, and reduced pay for some of its workers.

One of the issues for instant delivery companies in the more recent period (since mid-2016) is that it

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6 https://www.bcgperspectives.com/content/articles/retail_transportation_travel_tourism_same_day_delivery_not_yet_ready_for_prime_time/?chapter=6#chapter6

has become more difficult to get investors on board.

> (Despite huge progress), we haven't been able to raise additional capital to fuel the company until break-even. (…) We knew we had to gear up as one of our own investors acquired and invested aggressively in a direct competitor; now Foodora, and Deliveroo had just raised a massive round of funding. (…) That didn't help. (…) For the last 8 weeks, we've desperately tried to find solutions to keep the business alive. We've worked on both financing and acquisitions deals in parallel, unfortunately none of them materialised. We have now run out of time to keep operating business as usual, and are filing for judicial restructuring." (Roose, 2016).

Both Rougès and Montreuil (2014) and Laucirica (2016) stress the importance of revenue models in relation to supply and demand balance. The cost of an unfulfilled order is much more expensive than for Uber. If an Uber driver fails to show up you can rather immediately take another one, taxi or public transport. This is not the case for parcels and might damage the reputation of the sender. Good partnerships and a smooth supply chain are key.

Securing the right workforce

Finding competent drivers might be an issue for instant deliveries, all the more so as many couriers work for several platforms, including in some cases passenger operations such as Uber. This was reflected in a quote from the CEO of Postmates: *"We are all looking for the same students, freelancers, part-time workers and random people with cars and bikes looking to earn some extra cash"* (quoted in Schultz, 2015).

Targeting the general public, DHL "MyWays" experiment had a positive experience for recruitment. As one of the managers of the service told us, "*The distributors, 'Mywaysers,' got paid and were recruited through social media. Not one parcel disappeared! Could have been luck, we don't know. We did not check the workers (crime record). We used Facebook for recruiting"* (Lindell, 2016).

Additional concerns may include issues like theft, fraud, damage of parcels and late delivery and it is usually not clear where the responsibility lies (Laucirica, 2016). For instance, one of the interviewed companies mentioned that: "Insurance was another issue, we as distributors felt we were responsible, but there were no clear written parts on this" (Lindell, 2016). Additionally, a Sofres-La Poste survey (2013) of one thousand individuals identifies logistics complexity as a major barrier hindering the adoption of collaborative practices, ranked second only to fears concerning the security of exchanges.

Potential gains or pains for retailers

Laucirica (2016) argues that the digital platforms used in instant deliveries might open up opportunities both in the online business segment as well as in the store segment. Firstly, he claims, retailers in the online selling channel could outsource their operations and gain delivery speed and traceability. Secondly, those companies that only sell in stores, such as restaurants or food chains, could turn their stores into distribution hubs for online purchases, thus providing an omni-channel experience.

It is suggested that retailers can use open distribution centers or partner with other stores to reduce inventory stock-out risks. But these distribution centers are commonly located in the outskirts of cities and can be a barrier for instant deliveries, while it can reduce the need to stock inventory amongst stores, which is comparably expensive (Tompkins and Loftis, 2014, Rougès and Montreuil, 2014). Laucirica (2016) proposes that the retailers can let the customer select the option of "in-store pick up" and once the order has arrived to the store, process it through a crowd-shipping courier. This same business model has been used by e.g. DHL MyWays.

Potential gains or pains for society

It is important, again, to distinguish between insured professional carriers that pay tax and who deliver multiple times in a somewhat consolidated fashion (depending if they use cars or bicycles), and the private users who use the extra capacity in their vehicles while on a car trip for work or leisure. As we mentioned earlier, this latter category, P2P or "pure" crowd-sourced deliveries, is rather rare at the moment. Although it is a good example of how to use available resources efficiently, it opens up questions on insurance and tax, especially in the case of a private user who uses his/her privately owned vehicle to make a profit driving around in the city.

Even though last mile logistics has underutilization problems of its own, the substitution of a truck

with a series of under-utilized private vehicles with a lower load capacity, especially when cycle couriers are involved, implies a higher number of replenishments and therefore a larger distance traveled in total. If vans, private cars or motorcycles are used, this represents a net addition of energy consumption and emissions. Laucirica (2016) argues that this can be addressed by incentivizing the use of electric vehicles by couriers and crowd-shippers. In Paris, as seen above, most vehicles used are non motor-based, and a small share (1%) is even pedestrian or on rollers (with the additional use of public transport). Similarly, according to Lindell (2016), most of the DHL 'Mywaysers' used public transport, bicycles and walking.

Tax revenue evasion is another societal issue related to instant delivery and crowd shipping business models. Many free lancers making deliveries, especially in the pure crowd sourcing model, may not properly declare their full revenue, and when they do so, usually benefit from a lower tax rate than regular parcel and express transport companies. This may lead to a net financial loss for public budgets. In the DHL MyWays test, it was unclear whether anyone paid tax. Lindell's (2016) guess was that no one did, since it was a rather small scale demonstrator and was operated for a limited period only:

> We made the judgment that this would not 'fly', for four reasons. 1. Most likely because we were too early 2. It is not so difficult to go to an "ombud" (in Sweden an "ombud" is a store close by to the customer address; this network of stores is well organized and frequently used). 3. After some time we have to make money, or save cost, we did not see that the e-commerce companies wanted to pay extra for this. 4. We did not have the guts to take the step to replace any distributors ("steal their jobs, basically") (Lindell, 2016).

Labour and working conditions for couriers

Among the most salient issues related to instant delivery services are labor and working conditions for the couriers engaged in these activities. All countries, in variable intensity, meet with public debates about the costs and benefits of instant deliveries on employment and work conditions. All agree that these new services provide jobs, but the type of jobs is being discussed, as well as legal implications. Frey and Osborne (2013) evaluated the vulnerability of different economic sectors to job destruction due to digitalization. As for the delivery sector, digital platforms do not destroy jobs. For the moment, they create new net delivery jobs: instant delivery, especially in the food sector (see above) represents a service that was mostly provided before as a private activity (people would shop and cook, or eat out). However, an increasing part of instant delivery services comes from e-commerce for common goods. In this case, digital platforms do not necessarily create new jobs, they transform the types of jobs involved in the parcel and express transport industry: from employees to independent contractors. Another issue closely related to instant deliveries and work is road safety, especially in dense cities' streets.

Road safety: a hidden problem?

During our interviews, only one company (Mesh Korea) spoke spontaneously about road safety issues linked to delivery cyclists. We haven't found any specific scientific literature nor technical reports on bicycle couriers and road safety. Municipalities do not seem to have a specific analysis on them either. The City of Paris does not distinguish the type of activity a cyclist is engaged in. Delivery related bicycle activities, therefore, are not distinguished as a specific category in accidents and incidents on the street. Likewise, in Transport for London's road safety statistics, "pedal cyclists" are not further detailed. An interview (January 24, 2017) with the head of SMART, a Belgium cooperative for independent workers (see below) gave us the following number: out of 1200 couriers delivering for Deliveroo in Belgium, 18 serious accidents were reported in 2016.

Our data collection and interviews show that there is an increase in the provision of collective insurance deals for couriers from instant delivery companies.

"Gig workers"

There is mounting criticism in Europe against the "uberization of jobs," i.e. an increase in the share of jobs carried out by independent contractors using digital platforms. Though not as publicized as controversies related to Uber passenger services, instant deliveries are a key part of the discussion.

"Uberized jobs" are considered precarious and devoid of benefits such as right to unionize, health insurance or retirement benefits. In the delivery business, they are also accused of favoring dangerous behaviors on the road, as the revenue made is strictly correlated to the number of delivery tasks accomplished.

Promoting better work protection for independent contractors is one way forward. A California bill proposal pushed for independent contractors to be able to form their own negotiating organizations. The bill would have required tech companies to meet and negotiate with organized groups of independent contractors. It passed the California Assembly Labor and Employment Committee in 2015 but was then abandoned because of anti-trust concerns (Conger, 2016). The recent French law on Labor, Social Dialogue and Career Protection adopted in August 2016 has introduced the following changes to the French Labor Code applying to independent contractors using digital platforms:

- If they decide on the "characteristics" of the service and its price, digital platforms have a social responsibility towards the workers using them.
- Digital platforms must organize or pay for the insurance for work related accidents (NB for workers earning a minimum annual revenue, whose amount is not yet decided).
- Workers using these platforms have a right to professional training and the digital platform must pay for it (NB for workers earning a minimum annual revenue, whose amount is not yet decided).
- Workers can unionize and their bargaining actions – if reasonable – cannot cause motive for dismissal.

In addition to allowing independent contractors to form their own bargaining organizations, unions also favor the reclassification of independent workers as employees. In the US, several lawsuits in the instant delivery sector have recently resulted in such reclassifications. As referenced in the specialized press, important players such as Instacart, Shyp and Scoobeez (a contractor of Amazon Prime Now), have agreed to pay to compensate for not recognizing that their contractors were being used as employees[7]. One of these lawsuits came from four former drivers working for Amazon Prime Now in Los Angeles and specifically for its subcontractor Scoobeez.

> Amazon goes much further than Uber in controlling drivers' schedules and work activities. Amazon Prime Now drivers work regular shifts for an hourly rate and do not have the option to decline deliveries. They also wear Amazon Prime Now uniforms and are not allowed to work for other firms" (one former driver, quoted in Maddaus, 2015).

It was reported that Amazon pressured its subcontractor Scoobeez to settle the case, because of the bad publicity and potentially large sums involved if the lawsuit were to be continued.

It is however difficult to perceive whether the trend goes towards significant reclassifications or the continued use of independent contractors. In parallel to contracting with courier companies, Amazon has also been testing its own digital platform system for delivery gigs, called Amazon Flex. It has so far only been operating in the US and the UK, but the company seems willing to extend it. Flex drivers, whom Amazon calls "delivery associates", are independent contractors with pay advertised as $18/€16,8 to $25/€23,3 an hour in the US, and £12/€14 to £15/€17,6 in the UK.

An interesting (and unique) case comes from Belgium. A cooperative for independent workers, called SMART, has more than 1200 members working for the instant delivery sector (as of January 2017). Cooperative means these workers are actually employees of SMART.

Changes in market legislation

Freight and logistics market legislation can also be directly impacted by the rise in instant deliveries. One example is the impact on the type of vehicle. In France as well as in a few other European countries, a delivery company using a motor vehicle (including motorbikes and vans, but not electrically assisted bicycles) must, as mentioned above, have a specific freight transport license. As a consequence, most instant delivery platforms contract with bicycle users. A proposed change is

[7] According to the US legislation, they are now "W-2 employees", with more benefits and protection, especially overtime pay, lunch breaks and worker's compensation.

currently discussed, with two opposite views: one is to deregulate the market and open it to the use of motorbikes and scooters, therefore not obliging new instant delivery couriers to use bicycles only. The other one is to integrate bicycles in the requirement.

Another example of requested change related to instant deliveries is night shift work. In France, transportation and logistics are not listed as a sector that requires "24 hour continuity of operation," contrary to activities such as hospitals or bars. The 3PL industry is now lobbying to be integrated into such a list based on the argument that "consumers' demands for express deliveries have created new conditions" (from an interview with an e-commerce company, not willing to be identified).

A survey among Paris delivery couriers for instant delivery companies

A survey was made (Saidi, 2017) involving a questionnaire based on face to face interviews with 96 couriers. Half of them were randomly selected in the streets of the eastern neighborhoods of Paris, the other half were interviewed when they were delivering an order we had previously made online. Because of the way it was constructed, the sample cannot be fully representative of the instant delivery market in Paris. 98% of our sample members were men and only 2% were women. 96% were under 34 years of age. Their general employment situation is very diverse: 36% are students, 42% have another job, and 22% are neither student nor employed in other activities. Their level of education is extremely diverse: 31% have a higher education degree of at least three years after high school and 25% have a higher education diploma of two years after high school (professional college). On the other side, 23% have left school before high school. These, on the whole, have started working for an instant delivery platform more recently than the other group, which confirm our hypothesis that the job market is changing, recruitment of more full time less educated couriers today than one or two years ago.

Only 20% of couriers interviewed live in Paris. For those who don't, one third come to work in Paris by bicycle (they usually live in the close suburban towns around Paris); and two thirds come by suburban train, putting their bicycle in the train. Those tend to live in suburbs ten or more kilometers away from the center of Paris.

An interesting feedback was provided to the question: "what are your main items of concern?" Their main areas of concern are the following (in order of greatest concern to least concern and in % of occurrences):

- Rain, cold, bad weather conditions (21%)
- Problems with app, GPS or smartphone battery (20%)
- Congestion, pollution and traffic (19%)
- Bicycle theft and bike problems (13%)
- Lost time waiting for the order at restaurants (12%)
- Bike lanes (absent or ill-conceived) (7%)
- Other (8%)

Local policies

Instant deliveries pose a challenge for local transportation and planning policies. One such question is related to traffic and parking management. The rapid introduction of thousands of bicycle delivery trips and bike short term parking activity in a city has a potential impact on the general flow of urban traffic. However, this impact remains unknown and uncalculated, to our knowledge. A related issue is the potential need to review delivery time windows and the provision of loading/unloading bays in cities with large delivery bicycle traffic.

Zoning and planning policies are also affected by instant deliveries, when they involve a fulfillment center from which orders are prepared. This is the case for companies such as Amazon Prime Now, which handle general consumer goods. To service the population of Los Angeles, Amazon had already implemented several fulfillment centers in the L.A. area, in very urban locations (Silver Lake, Irvine, Santa Monica, and Manhattan Beach as of August 2016). This is not the case for restaurants and caterers providing orders directly from the stores. For the situations where a warehouse is involved, these warehouses necessarily need to be located within the city's limits, or very close by, as lead time between pick-up and delivery is very limited. Therefore, freight storage/pick-up facilities must be

accommodated within cities, which is made difficult by the fact that the private real estate market for urban logistics facilities remains limited (Dablanc *et al*., 2017). This generates the need to design zoning and planning policies that facilitate the introduction of urban warehouses, while making sure these facilities do not impact city life negatively in terms of noise, air pollution, congestion, aesthetics or energy consumption. This is a delicate balance, as was recently demonstrated in the case of Paris, where several "logistics hotels" were introduced (Dablanc *et al*., 2017). However, many successful cases for new urban warehouses can be identified in Asian cities such as Seoul or Tokyo (Dablanc *et al*., 2017).

Lastly, issues of local economic development are at stake. These new services generate jobs: the French Institute for Statistics recently released its latest numbers for 2016, showing that 13,500 self-employment jobs have been created in the parcel and courier sector, most of them in the Paris region, as against 3,900 in 2015 and less than 2,000 annually in the previous years. This is a clear impact of new instant delivery services, which also represent a potential disruption of traditional urban activities. It is interesting to see how the introduction of Amazon Prime Now service in Paris and Madrid at the same time (summer 2016) generated two very different attitudes from the local governments in charge. The Mayor of Paris, Anne Hidalgo, severely condemned Amazon, lamenting the fact that she had been kept uninformed about the new express delivery service, and protesting fulfillment centers in the city core as a direct and unfair competition to traditional retailing:

> I support a model of city in which small trades and shops have their full place. Why would these digital platforms escape the filters of regulation[8]? This kind of business represents actual retailing, even though they pretend they do logistics. I wish they would be requalified as retailers, because this is what they do, and I want them to be submitted to the rules of retailing (quoted in Mairie de Paris, 2016).

In Madrid, the new service was welcomed, on the basis of its contribution to the economic dynamism of the city:

> The City of Madrid is very happy to collaborate with Amazon, with the aim of attracting innovation in our city. (…) It is useful for job creation and it is useful for the good image of our city. Being the fourth city in Europe that Amazon has picked up for this new service demonstrates that the municipal team is receptive to innovations, and it shows the dynamism brought by Amazon through its presence in Madrid (Manuela Carmena, Mayor of Madrid, quoted in Gonzalez, 2016).

Conclusion

The demand for instant deliveries has existed for some time but until recently was seen as a niche service in areas such as urgent document delivery or some pizza services. The rise in e-commerce and the changing habits of consumers has resulted in a dramatic change in the demand for such deliveries and also a major increase in available services. The speed of the change has been such that not only are city planning and policies lagging behind in addressing the consequences but in the same way there is yet to be an established business model for such services. The exploratory research reported in this paper indicates that instant deliveries may already account for 2.5% of all freight delivery trips in a large city. The growth in instant deliveries raises the possibility of a significant increase in small vehicle movements in the middle of already very busy city centres. If this trend were to continue for the next few years then the results would be of major concern in terms of the impact on the urban street space and kerbside.

The desire of consumers for new services and their willingness to use recently developed apps to access them shows every sign of increasing. Yet at the same time it appears that consumers are unwilling to pay very much (or even at all) for such services. This raises a problem of profitability. Part of it is "solved" through the nature of employment for those working to provide instant deliveries. Self-employed courier cyclists have limited or no job security and a demanding work environment, which can lead to concerns about safety and the behaviour of the couriers involved. These concerns

[8] In France, any new construction of retailing space over a floor area of 1000 m^2 requires a specific permit, within the regulatory framework called "retail planning legislation."

will rise as the services grow. One of the brakes on service growth may be the reluctance of investors to continue to provide funding when profits and return on investment still seem a long way in the future. Even in the short time since 2015 there has been a marked decline in the willingness of investors to continue with funding for all services: a selection is now taking place, which should lead to accelerated bankruptcies and mergers in the sector.

Already it is possible to discern various categories of instant delivery service and in many cases the ones that are growing most rapidly appear to be those that result in single shipments being moved from the collection point to a delivery address. This can create negative consequences in terms of traffic congestion and the impact on the environment. However, environmental and air quality impacts are moderated by the nature of many of these deliveries which currently involve the use of bicycles or in some cases on-foot delivery. Yet as the volumes rise and time becomes even more critical and there is a search to expand the range over which such deliveries can be accomplished it seems likely that other transport modes will also grow with potentially greater environmental consequences.

The next few years will be characterised by a stronger focus on optimising services and ensuring that quality of service is achieved. One way in which this will happen is through the application of technology but another path is from the growing partnerships between organisations with a strong logistics or retailing tradition and those companies that have entered a rapidly changing market (such as, recently, Postmates and Starbucks, or Stuart with La Poste group and Franprix). Another potential direction of change is consolidation. The very nature of instant deliveries (many of them courier deliveries of single consignments, on short distances and with little time) makes consolidation difficult. Some companies try to overcome these challenges: Amazon Prime Now in Paris has sufficient orders to consolidate at least three to five deliveries per trip before a delivery vehicle leaves the urban warehouse. Finally, P2P (or "pure" crowd-sourced deliveries), involving private individuals using spare transport capacity on their way to work, shops or leisure, may also grow, as a niche market. As DHL mentioned to us about their DHL MyWays test, "*There is something in this anyways. We had to leave it for now. We will pick it up when it has reached maturity.*"

Predicting the consequences of these dramatic changes in combination is extremely difficult. But it is essential that city planning and policies take account of these developments and consider how planning and possibly regulation needs to be adapted to these new ways of doing things. This extends to land use planning where it is becoming increasingly clear that there is a need to re-think the provision of logistics spaces in cities if we are to avoid the rise of increasingly fragmented deliveries. Such planning will also have to harness the interest of the real estate companies that in recent years have sought opportunities for large scale developments on the edge of the city.

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Appendix 1

Table of companies providing digital platforms for instant deliveries

AA Name	Associate company/ Holding company	Operating areas	Origin	Year	Unit size	Type of goods	Range	Type of drivers	Vehicle
Amazon Fresh+J23A2:J24	Amazon	Cities in USA, UK (London)	Seattle, OR - US	2008	Parcel	Grocery, Retailing	Urban	professional	Trucks
Amazon Prime	Amazon	Cities in US, Europe, Japan	New York, NY- US	2014	Parcel	Retailing	Urban	professional, self-employed	Bikes, Scooters, Cars, Vans
Baghitch		Sweden	Sweden	2014	Parcel, Bulky goods	Furniture, Moving, Others	Nation wide	p2p	
Bevy		UK	London, UK						
BigFoodie		UK	London, UK	2016	Parcel	Prepared meals	Urban	professional, self-employed	Bikes
Box2 Home		Paris, FR	Paris, FR	2016	Oversize, Bulky goods	Furniture, Moving	Urban	professional, self-employed	Vans, Pickups
BuddyTruck		Cities in the US	Seattle, OR	2014	Oversize, Bulky goods	Furniture, Moving			Vans, Pickups
Convoy	(Amazon as investor)	America	USA	Seattle	Pallets		Regional, Long distance	transport operators	
Deliveroo		EU; Australia; Singapore; Dubai	London, UK	2013	Parcel	Prepared meals	Urban	professional, self-employed	Bikes, Scooters
Delivery.com	Facebook	US		2015	Parcel	Prepared meals, Grocery, Alcohol, Laundry		professional, self-employed	
DiningIn/ LAbite	GrubHub - Seamless	USA; UK	Loa Angeles, CA-US		Parcel	Prepared meals	Urban	professional, self-employed	
DoorDash		cities in US	San Francisco, CA -US	2013				professional, self-employed	
Ebay Now	Ebay	New York, US	New York, US	2013-2014 (over)	Parcel	Grocery, Retailing	Urban	professional, self-employed	
Ele.me	Alibaba, Alibaba express, Taobao	China	Shanghai, China	2008	Parcel	Prepared meals	Urban	professional, self-employed	Bikes, Scooters
FleetZen		America	USA	Seattle	Oversize	Furniture, Moving	Urban, max 100 miles	professional, self-employed	Vans, Pickups
FoodExpress	Takeaway	the Netherlands			Parcel	Prepared meals	Urban	professional, self-employed	
Foodora/	Delivery Hero	EU;	Berlin, DE	2014	Parcel	Prepared	Urban	professional,	

Hurrier/ Suppertime		Canada; Australia				meals		self-employed	
Freightos			Jerusalem, Israel	2015	Pallet		Regional, Long distance	transport operators	Trucks
Ghostruck		America	USA	Seattle, 11 cities in total	Oversize, Bulky goods	Furniture, Moving	Urban		Trucks
Google Express	Google	cities in US	San Francisco, CA -US	2013	Parcel	Grocery, Retailing	Urban	professional, subcontractors OnTrac, FedEx, UPS, Dynamex and Lasership	Bikes, Scooters, Cars, Vans
Gousto		UK	London, UK	2012	Parcel	Meal kits	Urban	professional, self-employed	Bikes, Scooters, Cars, Vans
Instacart	Collaborations Safeway, Whole Foods, Super Fresh, Harris Teeter, Stanley's, Costco, etc.	USA	San Francisco, CA -US	2012	Parcel	Grocery, Retailing	Urban	p2p, professional, sub-contractors	Bike, Scooters, Cars
Jinn		UK	London, UK	2013	Parcel	Prepared meals, Grocery, Retailing	Urban	professional, sub-contractors	Bikes , Scooters
Just Eat Delivery	Just Eat	Europe	London, UK	2015	Parcel	Prepared meals	Urban	professional, sub-contractors (ScootFleet) and self-driving robots Starship	Bikes , Scooters
Laundrapp		UK	London, UK	2012	Parcel	Laundy	Urban	professional, self-employed	Vans
Laundry Republic		London	London, UK	2009	Parcel	Laundry	Urban	professional, self-employed	Vans
Marley Spoon		US; EU; Australia	Berlin, DE	2014	Parcel	Meal kits		p2p	
Mesh		Korea	Seoul, Korea	2013	Parcel	Prepared meals, Retailing	Urban	professional, self-employed	Bike, Scooters, Cars, Vans
Minibar		cities in US	New York, NY -US	2013	Parcel	Beverage, Wine, Spirits	Urban	professional, self-employed	Bike, Scooters, Cars, Vans
MyWays	DHL	Sweden	Sweden	2012	Parcel	Mostly retailing	Urban	p2p	
Nimber		Norway; UK	Norway	2010	Parcel, Bulky goods	Mostly retailing	Urban, Regional, Long distance	p2p	Bike, Scooters, Cars, Vans
PiggyBaggy		Finland	Helsinky, Finland	2014	Parcel	Books, Grocery	Urban	p2p	Bike, Scooters, Cars, Vans
Postmates	collaborations with Starbucks, Chipotle, 7-Eleven, Walgreens, Apple	cities in US	San Francisco, CA -US	2011	Parcel	Prepared meals, Grocery, Retailing	Urban	p2p	Bike, Scooters, Cars, Vans
Roadie		US	Atlanta, GA - US		Parcel, Bulky	Mostly retailing	Urban, Regional	p2p	Bike, Scooters

					goods		, Long distance		, Cars
Stuart	La Poste	France, UK	Paris, France	2015	Parcel		Urban		Bikes , Scooters
TokTokTok		France	Paris, France	2013	Parcel		Urban	professional, self-employed	Bikes , Scooters
Trusk		Paris, FR	Paris, FR	2016	Oversize , Bulky goods	Furniture , Moving	Urban	professional, transport operators	Vans, Pickups
Uber Eats (+UberFresh, UberRush)	Uber	US; EU	Santa Monica, CA - US	2015	Parcel	Prepared meals	Urban	professional, self-employed	Bike, Scooters , Cars, Vans
UberVan, UberFreight	Uber				Parcel, Pallet		Urban, Regional , Long distance	professional, self-employed	Vans, Pickups
Yihaodian	WalMart		China	2008	Parcel	Grocery, Retailing	Urban	professional, self-employed	Bike, Scooter, Cars, Vans