MOBILITY AND LOGISTICS

Sector focus

Last mile

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Table of contents

Last mile: concept and relevance

The rise in **e-commerce** has resulted in an increase of in-person deliveries to final customers, a trend known as **last mile**. This trend has a direct impact on urban mobility. Goods travel through several logistics centres and warehouses during the different stages of the logistics process before arriving at the sales or delivery point at the time and place requested by the customer. Last mile is a key social and environmental challenge for cities of the present and the future - we must redesign last mile routes to make them more efficient in terms of **urban sustainability**.

Last mile deals with parcel management, focusing on the **last part of the delivery route**. On this last leg of the journey, packages are gathered in a warehouse or hub and then are distributed throughout the different areas of the city. This is the reason why the last mile is also referred to as **capillary distribution**.

Last mile management varies according to the needs of each logistics chain. Final delivery in a logistics chain of B2B production - in which the last mile entails, for instance, supplying parts to manufacturers or businesses - differs from a direct delivery to the final B2C customer, which involves either handling the package directly to the customer or dropping it off at a delivery point or locker.

There are **three key components** to take into account when planning last-mile deliveries:

- **Transport route**. Journeys should be planned considering all deliveries scheduled during the route to make them as efficient as possible.
- **Package type**. Package size and transport requirements also have an impact on journey design, as several types of packages may have to be delivered during the same journey - fragile items, products that need to be shipped cold, etc. Package type may also determine the kind of vehicle used for the delivery.
- **Delivery conditions**. Delivery time and specifications should also be taken into account when planning a delivery. For instance, conditions will differ depending on whether the delivery is contact-free or if the parcel is to be delivered to a business or a locker.

Besides, companies in the logistics sector are facing the challenge of optimising service efficiency. At the same time, they are working towards achieving a more competitive and sustainable model of logistics and urban mobility. Therefore, it is imperative that companies strive to **reduce negative externalities** in the last mile, such as the use of urban space, noise levels, and greenhouse gas emissions.

Last mile in figures

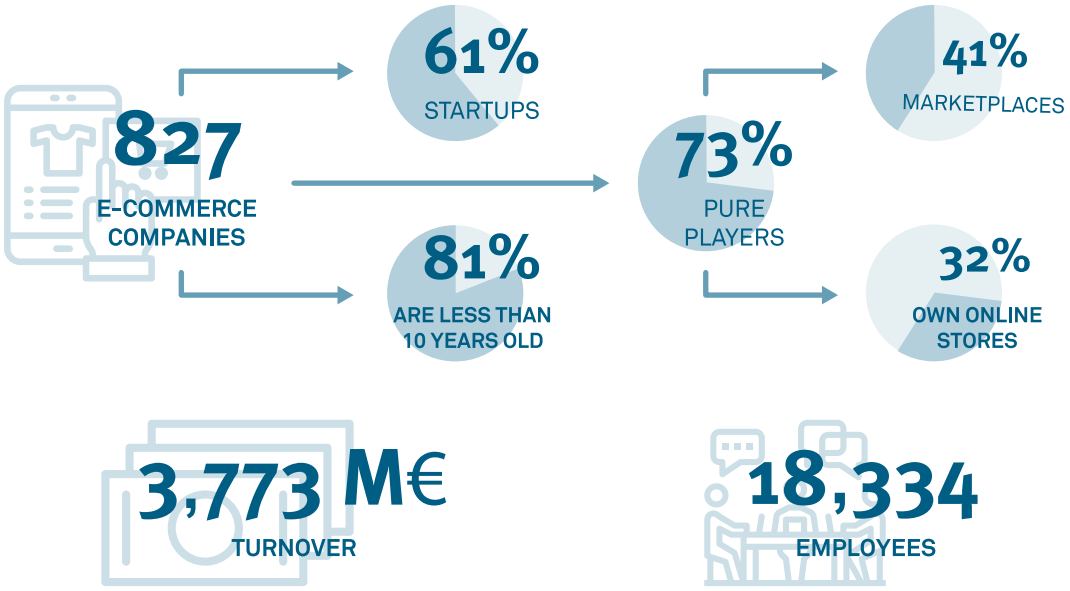
According to Statista, in 2020 worldwide retail e-commerce traffic hit a record of **22 billion monthly visits to online shops**, with estimated sales of over 4 trillion dollars. There was an exceptionally high demand for items of daily use such as food, clothes and tech gadgets. Spain's 7th eCommerce Annual Report 2020 shows that 72% of Spanish Internet users between 16 and 70 years old shop online. This amounts to 22.5 million people.

Additionally, according to data gathered by the Logistics Observatory of Catalonia, **more than 35% of the Catalan population shopped online** at least once in 2019, an year-over-year increase of more than 8% since 2015. In absolute terms, it is estimated that a total of 47.8 million online transactions were made in 2019.

ACCIÓ's report e-Commerce in Catalonia indicates that in 2020 there were a total of **827 companies** in Catalonia dedicated exclusively to either selling their products in digital environments or giving technical and logistical support to make it possible. These companies have a total **turnover of over 3.77 billion euros** (1.5% of GDP) and **employ over 18,300 people**. Given this increase, it must be pointed out that 81% of these companies were created during the last decade and 61% are startups. Regarding the nature of these companies, 73% are **pure players**, meaning they sell their products through marketplaces (41%) or through their own online stores (32%).

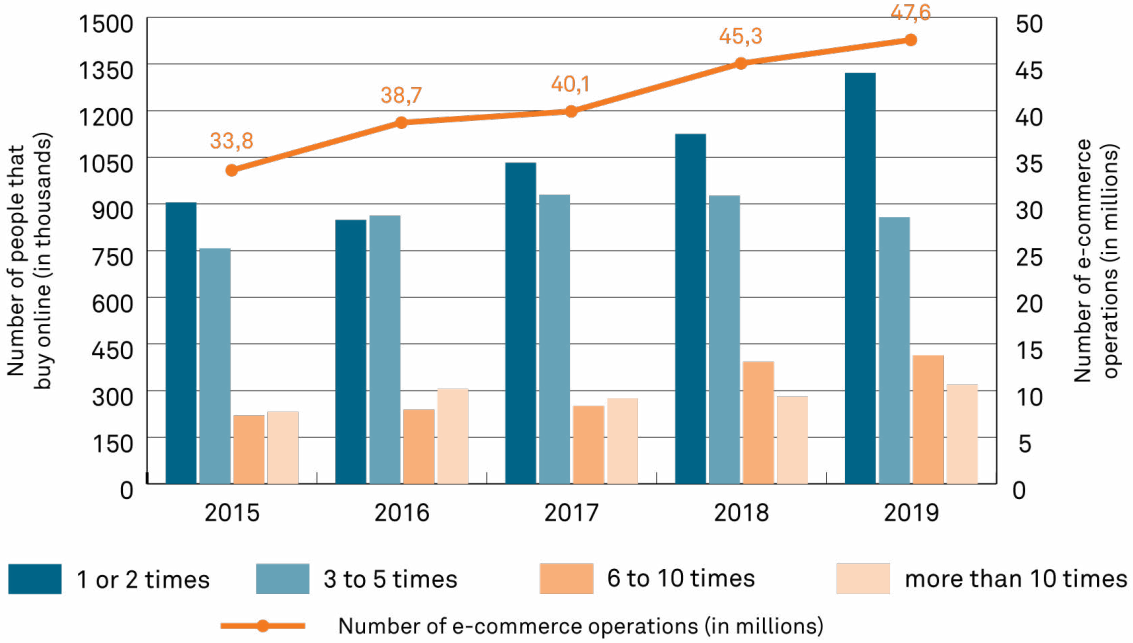
A larger number of online purchases result in higher levels of polluting emissions, as they require larger fleets of delivery vehicles driving around the cities and therefore increase road traffic volume.

Figure 1. E-Commerce and last mile figures in Catalonia



Source: Prepared by the authors, based on data from the report e-Commerce in Catalonia (2020)

Figure 2. Evolution of e-commerce operations by number in Catalonia



Source: Prepared by the authors, based on data by the Logstics Observatory of Catalonia (2020)

In Spain, it is estimated that about 25% of polluting gas emissions result from freight distribution. The report The Future of the Last-Mile Ecosystem suggests that **last mile emissions will increase by 36% in 100 European cities by 2030**.

At the same time, according to a report by Deloitte, the last mile accounts for **40% of total logistics costs**. Additionally, last mile management has a direct impact on customer satisfaction. Therefore, the whole process could be greatly affected if there are delays, mistakes or difficulties during this last stage. According to the latest report by last mile operator Geever, **there are 63,000 last-mile deliveries taking place every day in Barcelona.** 630 vans are used, that make a total of 75,600 stops and drive 94,500 kilometres daily during working hours. These figures make it obvious that this last stage of delivery needs to be optimised to become more sustainable and local.

Transformations in the sector involving last-mile deliveries

Last-mile deliveries have become one of the crucial pieces for logistics and mobility companies. Demands from consumers, such as a **shorter delivery time**, urge the sector to deal with last-mile deliveries in a more efficient and transparent way, as well as to speed up processes.

Within the context of logistics renovation emerging from new needs, the agents in charge of last-mile delivery are promoting models that are **more financially and environmentally sustainable** and have a lower impact on urban traffic.

- **Companies are digitalising their warehouses** to manage large package deliveries through process automation and massive data usage.
- **Delivery routes are optimised and use technologies** such as geolocalisation and blockchain traceability, which reduce delivery costs.
- **Vehicle fleets**, old and quite polluting, **are replaced by more efficient alternatives** such as hybrid and electric vehicles, which reduce gas emissions.
- **The value chain is modified as logistics hubs are moved into cities.** Last mile deliveries are done by smaller and more sustainable vehicles, mainly motorbikes and e-bikes, which make the final stage of the delivery more sustainable.

Otherwise, properly managing last-mile deliveries in city centres becomes more costly for companies - in comparison to other elements of the logistics distribution chain - as cities are increasingly adopting **more strict environmental measures**. Because of that, some companies are **raising awareness amongst their customers** about the implications of only valuing immediacy in deliveries, and are promoting alternative models that take sustainability elements into account.

At the same time, the market of Mobility and Logistics has become more dynamic and innovative in recent years, and therefore more competitive. Specifically, there has been a surge of startups specialised in last mile and package management, known as new couriers. New couriers, such as Instapack and Stuart, are **highly technologically innovative** and help to **reduce costs** and **improve quality and efficiency of deliveries** in the last leg of the logistics chain.

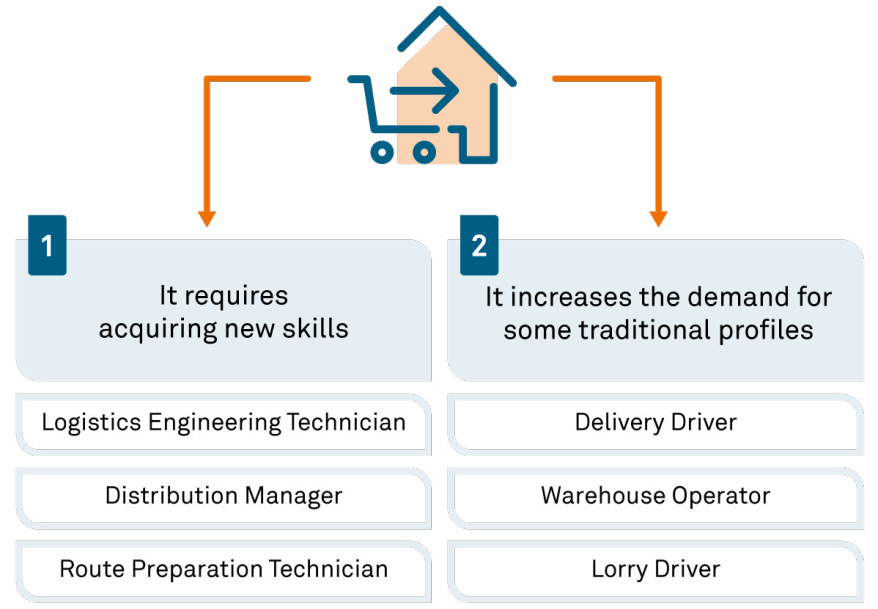
In this sense, new couriers stand out against traditional logistics companies because of the following differential values:

- **Complete** traceability of goods. These companies are striving to design more optimised and faster routes that provide real-time tracking of the delivery journey, which may be shared with the consumer.
- **Flexibility** in product delivery. They meet the customers' demands regarding delivery time and location to achieve higher customer satisfaction.
- **Immediacy** of delivery, including same-day deliveries.

Impact of last mile on professional profiles

Because of the technological innovations influencing last-mile deliveries and the rise in e-commerce, companies and their staff need to undergo an **adaptation process** on an organisational level. Establishing and promoting last mile in companies implies a **higher demand of existing professional profiles**, who should reinforce the related organisational structure. Professionals that are more directly impacted by this trend must also **acquire new knowledge**, become more specialised and develop new skills.

Figure 3. Impact of last mile on employment



Source: prepared by the authors

Therefore, as last mile strategies are applied in companies, some of the professionals working in the Mobility and Logistics sector will be affected. Those specialising in last mile management will be required to upgrade their skills and knowledge, and their roles and tasks will be subject to change.

Logistics Engineering Technician specialised in e-commerce: This professional, who is in charge of developing logistics systems and logistics chain integration, will be one of the most directly involved in last mile management. A Logistics Engineering Technician will specialise in managing trade operations and distributing products and services through e-commerce platforms and marketplaces. They should know the difference amongst the existing marketplaces (B2C, B2B and C2C), analyse and work with large data volumes, and be familiar with methodologies that improve user experience. Then, they should coordinate the data gathered with the management of the last-mile delivery chain, which they should know in detail.

Distribution Manager:They design, establish and control the conditions of distribution of finished products and storage, including warehouse locations and maintenance systems. As last mile is implemented, Distribution Managers will be required to be versed in delivery software - such as route-planning software - as well as in new tools that allow real-time tracking to solve unexpected problems and keep the customer informed. Distribution Managers should also be up-to-date with the new trends regarding energy efficiency, sustainability and smart mobility.

Route Preparation Technician: They are in charge of organising and optimising vehicle routes for deliveries. Route Preparation Technicians should know about and use new information technologies applied to vehicles (GPS, mobile terminals, digital tachographs) to perform real-time tracking and, for instance, ask the delivery driver to make adjustments to their route to load unplanned freight.

Other professional profiles are already dealing with part of the last mile chain, and are expected to grow in demand with the generalisation of this trend:

Delivery Driver: They are in charge of the capillary distribution (final delivery) of a product to consumers, usually by motor vehicles such as vans, motorbikes and bicycles. As Delivery Drivers spend a big chunk of their time on the road, those considering acceding to this role should enjoy driving. Other valuable skills for this role include having basic computer literacy as well as being customer focused, as they are often the only face of the company.

Warehouse Operator: Their tasks include warehouse maintenance, storage and forecast of orders. They carry out operations of unpacking and warehouse positioning. Warehouse Operators should be somewhat familiar with the software involved in warehouse management operations. The emergence of last-mile deliveries may lead to an increasing demand for staff handling stock more directly.

Lorry Driver: They are responsible for transporting freight by road and managing any related documentation. Lorry Drivers carry out transport operations following the established routes and pick up and drop off freight. At the same time, they must collect the operational documentation and return it properly filled in.

Last mile, in focus

The future of last mile is determined by two factors: first, assimilating **new means of technology and communication** will result in an updated catalogue of job opportunities; second, there will be **new models of mobility** characterised by their sustainability, energy efficiency and environmental care.

Analysing delivery data obtained from mobile apps opens a window for optimising distribution in the new mobility models. Internal, traffic and road network **data analysis** helps to plan more efficient routes, reducing distribution costs and fleet needs. In another vein, **automation** and **robotisation** within Mobility and Logistics by using autonomous vehicles for last mile deliveries will result in fewer traffic jams and accidents, and possibly lower mortality rates.

Other innovative initiatives that favour environmental care, relieve traffic congestion and allow for faster deliveries are also emerging. For instance, last mile **urban distribution hubs** (also known as micro hubs) are spaces where traditional combustion vehicles drop off the goods, which are then picked up by zero emission vehicles for last mile delivery. **Smart lockers** in public areas receive and safely store packages until they are picked up by the customer. Another example is **smart packaging**, which is able to control parameters such as temperature, pressure and humidity. It is especially useful for food and medicine deliveries. At the same time, the use of **drones** is becoming crucial, as these devices allow to reach areas that are either remote or difficult to access.

At the same time, new alternatives -such as Amazon Key App- are being set out to enable final deliveries without the presence of customers.

In summary, there are solutions and alternatives in sight looking to transform the concept of last mile towards a **more efficient, sustainable and smart model**.

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