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2018 URBAN MOVE REPORT

SIGNED, SEALED, DELIVERED
– ANALYSING THE IMPACT OF
E-COMMERCE ON URBAN AREAS

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– ANALYSING THE IMPACT OF
E-COMMERCE ON URBAN AREAS

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E-COMMERCE AFFECTS
URBAN AREAS, AND
THE IMPACT WILL
BECOME MORE AND
MORE APPARENT AS
VOLUMES CONTINUE
TO INCREASE.

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1.
INTRODUCTION

From electronics to groceries – today, nearly everything we need can be ordered online and delivered to our doorsteps. For the consumer, e-commerce can be a time and cost saver. For urban planners, retailers and logistics companies, on the other hand, the great flow of products from manufacturer to consumer presents completely new challenges. What are the effects of increasing e-commerce in our European cities? And what can be done to facilitate this transformation of our shopping habits?

Global e-commerce has expanded at a high rate over the past decade, although it still constitutes a relatively low share of total turnover. Growth is expected to continue, partly due to the shopping habits of European millennials.

Shopping has traditionally been a relatively predictable behaviour with respect to location and time, but it is now part of increasingly complex travel patterns – goods can be purchased almost anywhere and anytime, and delivered in a variety of ways.

RETAILERS AND LOGISTICS COMPANIES NEED TO ADAPT TO E-COMMERCE AND TRANSPORTATION AND URBAN PLANNERS NEED TO ASK THEMSELVES HOW EVERYDAY LIFE IN FUTURE URBAN AREAS WILL FUNCTION AND WHAT REQUIREMENTS THAT MAY ENTAIL.

This Urban Insight report argues that e-commerce is more than a logistics issue – it also affects city planning and properties. This report focuses on business-to-consumer (B2C) online sales of physical products.

It starts by describing the consumer perspective, followed by an introduction to the logistics of e-commerce and some applied solutions for delivery. A summary of studied and anticipated effects of e-commerce is provided, followed by concluding remarks.

Figure 1.
Report structure.



2. E-COMMERCE IN EUROPE



The e-commerce maturity of companies and customers, supply chains and delivery systems varies among European countries. For customers (i.e. citizens), e-commerce behaviour depends on different variables, such as age, gender, social status, culture, lifestyle and interests, place of residence, technical maturity, and the availability of services.

2.1 CITIZEN AND CONSUMER PERSPECTIVES



THE INTERNET-MATURE STUDENT

Hansi is a 22-year-old student living in northeastern Berlin, Germany. He studies computer science and is currently living at his aunt's house while looking for a flat of his own. Having grown up with the internet, Hansi is very interested in technology and has a very high level of internet maturity. He therefore makes a lot of his purchases online, and not only from Germany. Hansi purchases clothing, student literature and of course technology products, such as mobile phones, watches, computers and gadgets, online. Occasionally, he orders food online delivered to his door after a late night. He also searches for harder-to-find products, which he obtains from sites like AliExpress or Amazon. Besides using various forms of online streaming, Hansi also collects old games for classic game consoles and buys a lot of secondhand products online from Germany and abroad. Since price is important for Hansi, he accepts waiting an extra day for delivery to save on transport costs, although he prefers when the transport cost is included. Recently, he and some friends from university launched their own e-store selling customised smart watches ordered from China through the Alibaba website.



THE JUGGLING URBAN PARENT

Susan is a 39-year-old mum who lives in the southern suburbs of Manchester, UK. She is well educated and has had a successful career as a sales manager. Katie is currently on parental leave with her second child Nathan. Her husband Steven works as a financial advisor and commutes by train to the city centre, as the family has decided not to own a car. Time is a valuable commodity for the family, and Susan is responsible for most of the household's purchases. She still buys most groceries in the nearby supermarket, but she also buys a lot of her and the children's clothing online, as well as toys, furniture and heavy groceries. The home delivery option has eased her household's daily routine. When they refurbished the kitchen Susan spent some time online finding good bargains on materials, furniture and utensils. Everything was delivered to the home and installed by contractors. Also, since Susan has an interest in fashion, she occasionally organises evenings for her friends where they order a lot of clothes in advance, which they can easily return if needed.



THE MOBILE BUSINESS COUPLE

Michele is a 54-year-old man living in Marseille, France, with his wife Camille. They have a daughter, Amelie, who recently moved to study in Paris. Michele worked for many years as marketing director at a large international company, but started his own consulting firm a few years ago. He has customers all over France, as well as in other countries. He tries to arrange most of his meetings in Paris so he can spend time with his daughter. Michele and Camille both have busy lifestyles and are often away on trips. They like to spend their spare time with family and friends. They make a lot of purchases online, such as technical products, books and clothing. Since they're often not home, flexibility is important, as is the option of having purchases delivered to one of several different addresses (e.g., to their home, office, hotel, or their second home in Bretagne.) They don't think much about money and gladly pay a bit extra for quick deliveries to wherever they happen to be. Michele likes to cook and often orders groceries and beverages online, which he collects on his way home from the office or the airport.



THE CONSERVATIVE RETIRED WOMAN

Ingrid is a 75-year-old retired woman living in a small house outside Gothenburg in Sweden. She has lived on her own since her husband passed away three years ago. Ingrid is not very internet-mature, and is not particularly interested in becoming so. Ingrid makes most of her purchases at stores when she is in town, or occasionally at her local supermarket. She reads a lot, and her daughters have shown her how to buy books online using a tablet that her daughter bought her last Christmas. She has most of her books delivered by parcel post to her letter box, which she finds very convenient. Sometimes, though, the books are too large and need to be collected at her local pick-up point. She doesn't mind this arrangement, since she can collect her parcel at the local supermarket where she buys her groceries. She used to have to go to the hospital to pick up her medication but she can now order it with her tablet for home delivery. This is convenient, although Ingrid sometimes misses the social encounters she had at the hospital.

2.2 E-COMMERCE IN EUROPE – FACTS AND FIGURES

There are a lot of interest in figures on e-commerce and many different sources. We offer a glimpse based on official statistics and relevant published surveys.

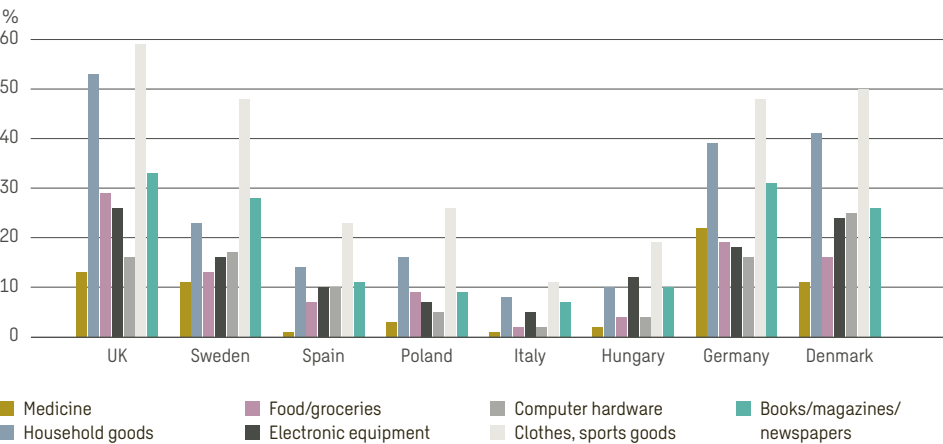
E-COMMERCE IS GROWING AT A HIGH RATE

On the EU level, 2 per cent of business-to-consumer (B2C) sales were made online in 2016. The corresponding figure for EU-level retail B2C sales was 5 per cent, with Eurostat citing 12 per cent for Sweden and 8 per cent for the UK. B2C e-commerce is a relatively new phenomenon and began representing a statistically measurable percentage only a few years ago. The e-commerce turnover growth rate has been in the double digits (typically 10–15 per cent per year) for several years¹ and is expected to continue its growth, while store retail is growing but at a much slower rate (typically 1–2 per cent per year). People also tend to spend more money on e-commerce in more mature markets than in less mature markets.²

NORTHERN EUROPEANS MOST ACCUSTOMED TO ONLINE SHOPPING

Clothing and sports equipment are the items purchased most often online. On the EU level, 30–40 per cent of individuals have purchased clothing and sports equipment online. The second largest category for online purchases is household goods, with an EU average of over 20 per cent of individuals making these purchases. Notably, food and groceries are in the same range as computer hardware and electronic equipment, with 10 per cent of individuals buying these goods. Percentages are higher in Western and Northern European countries, while Southern and Eastern European countries generally have a lower share of individuals who have made online purchases.

Figure 2. Share of individuals who use e-commerce in selected countries. Data for 2016. Source: Eurostat



URBAN RESIDENTS SLIGHTLY MORE INCLINED TO BUY GOODS ONLINE

Eurostat statistics indicate that a larger share of individuals use e-commerce in more densely populated areas than in less densely populated areas. This difference is not very pronounced, however, which shows that e-commerce affects both urban and rural areas.

1) Statistics available from the UK: Office for national statistics; Sweden: e-barometern årsrapport 2017, PostNord
2) E-handeln i Europa 2017, PostNord

AGE AND GENDER DIFFERENCES IN ONLINE SHOPPING BEHAVIOUR

Younger people are generally more inclined than older people to make online purchases. Clothing purchases are more popular among younger online shoppers, while household goods and food & groceries are more popular among middle-aged shoppers. Food & groceries and clothing are generally purchased more often by women, with men buying more electronic hardware.

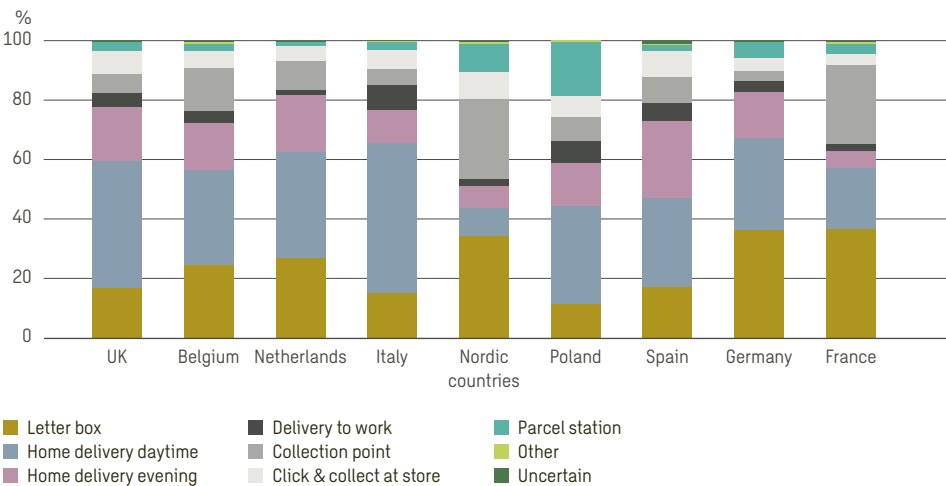
LARGE PROPORTION OF CLOTHING PURCHASES ARE RETURNED

E-commerce returns are common but vary widely between product categories. Clothing and shoes are returned most often, with 30–50 per cent of online shoppers having returned these items. Home electronics and home furnishings are also commonly returned, but to a lesser extent.³ This demonstrates that the fitting room is moving from in-store to people's homes.

DELIVERY PREFERENCE IS NOT BASED ONLY ON THE PRODUCT ORDERED, BUT ALSO ON NATIONAL CIRCUMSTANCES

Figure 3 shows consumers' delivery preferences, not actual delivery methods.⁴ Collection points are commonly requested in Nordic countries and France. Home deliveries are dominant in most countries. Home deliveries are very common in the UK, with the small non-food product category by far the most common for this delivery method. Groceries, large non-food items and takeaway meals are also product categories where home delivery is common.

Figure 3. Delivery preferences. Source: PostNord 2017.



3) E-handeln i Europa 2017, PostNord
4) E-handeln i Europa 2017, PostNord

STILL, FEW CUSTOMERS REQUIRE EXTRA FAST DELIVERY

Most consumers accept a delivery time of 3–5 days.⁵ In the Netherlands there is a preference for faster deliveries while in the Nordic countries longer delivery times are accepted. In the UK, Poland and Italy around one-third of e-commerce consumers are willing to pay extra for fast delivery. The UK has moved towards more next-day deliveries, from one-fifth to one-third of parcel deliveries between 2013-2016. Faster than next day delivery still represents a small share.⁶

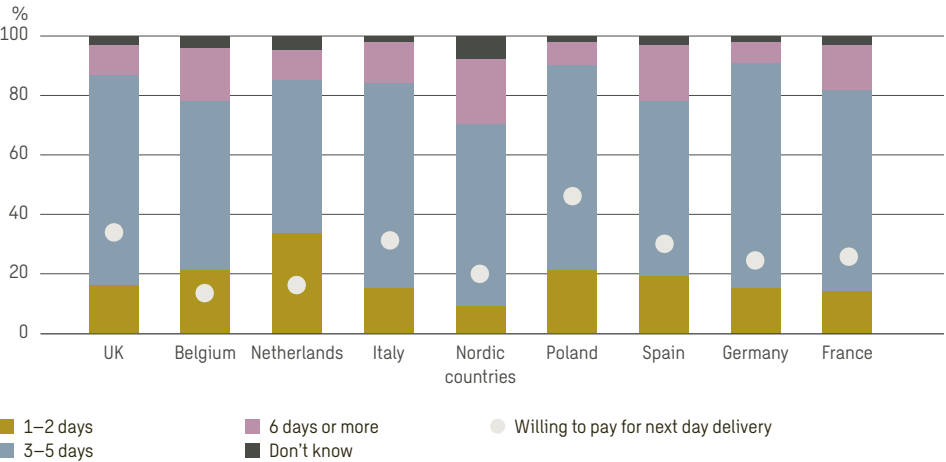


Figure 4. Expected delivery time for e-commerce purchases. Source: PostNord 2017.



5) E-handeln i Europa 2017, PostNord
6) An analysis of online shopping and home delivery in the UK, J. Allen et. Al. 2017

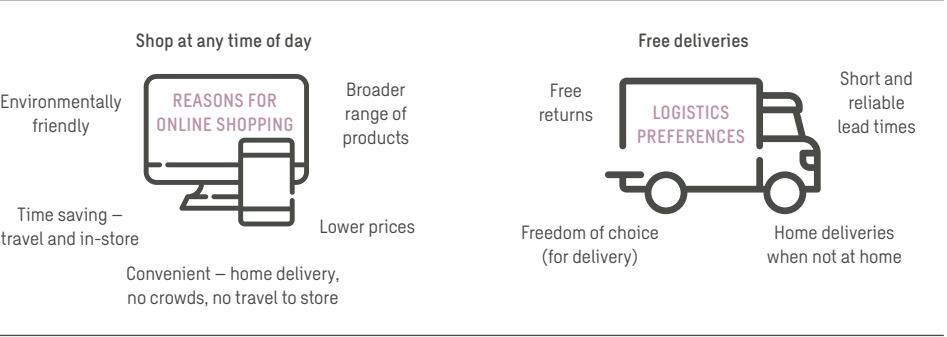
2.3 WHAT THE STORIES AND STATISTICS TEACH US

People have different reasons and motivations for using e-commerce. The timesaving aspect is the most important aspect for some people. This group buys a vast variety of products online and is willing to pay extra for this convenience. For others, the range of products available urges them towards e-commerce and offers access to products not available in local stores. Price is important for many, and e-commerce offers competitive prices. Some prefer to shop in stores but still use e-commerce for some product categories to avoid travelling to some stores or for the convenience of not needing to carry products home. People who do not own cars may use e-commerce for sustainability reasons.

E-commerce utilisation and delivery preferences differ greatly between European countries. Figure 5 summarises the reasons consumers shop online and their main delivery preferences. Growth is strong throughout Europe and is expected to continue for years to come as people become more accustomed to e-commerce.

Due to all of these behaviours related to and motivating e-commerce utilisation, retail supply chain solutions are experiencing a dramatic shift in required performance – and therefore also in optimal design – as compared to supplying stores. The convenience aspect is expected to place even greater demands on delivery time and convenient options such as home delivery. And the growth of e-commerce will further reveal and accentuate the demand for sustainability of applied solutions.

Figure 5. Reasons for online shopping and major logistics preferences (based on PostNord 2018).



3. UNDERSTANDING THE E-COMMERCE SUPPLY CHAIN



The e-commerce supply chain can be a crucial factor in city planning and urban life. Understanding the e-commerce supply chain helps us understand how urban life and city planning may be affected by e-commerce.

ADDRESSING NEW SUPPLY CHAIN CHALLENGES

In developed economies, e-commerce represents the latest big driver of change in retail logistics and physical distribution networks over the past 40 years or so. Traditional supply chains are typically developed for business-to-business delivery (B2B), which places a clear boundary on how far the business-controlled service is taken in the supply chain. Delivery generally concerns store restocking, and the delivery interface is in this case a retail point.

E-commerce logistics for Business to Consumer (B2C) delivery places new demands on the supply chain. The e-commerce supply chain needs to manage order fulfilment on an item level as well as last mile transportation, which are overseen by the consumers themselves in a traditional store. One result of this is that consolidated transports from centralised warehouses to stores have been replaced by parcel deliveries directly to consumers from e-retailers' centres via parcel hubs. Consumer returns are an added e-commerce flow and must be transported back to warehouses and processed.

E-commerce logistics creates a need for re-designed or new logistics functions that are well integrated in the urban space. Warehousing, logistics networks and transports are affected and become less efficient as handling increases and transport fill rates drop. And all of these aspects affect the urban area.

FROM MANUFACTURER TO CONSUMER

Logistically, e-commerce can be set up with an e-fulfilment centre where customers' orders are packed and sent to a parcel hub where sortation to a parcel delivery centre close to the consumer takes place. Less-Than-Truckload (LTL) networks are used for bulky or heavy goods. Urban fulfilment centres, supplied by the more centralised e-fulfilment centres, are used when delivery time is short. Final transport from the parcel delivery centre or LTL terminal to the consumer is known as the "last mile". This last mile is commonly serviced by van or light truck based at parcel sortation centres located near greater urban areas.

Also, returns need to be managed through the logistics network when no physical store exists, and are normally processed through the same transportation network. The return process is often incorporated into e-fulfilment centres, with returned items placed back into stock for resale.

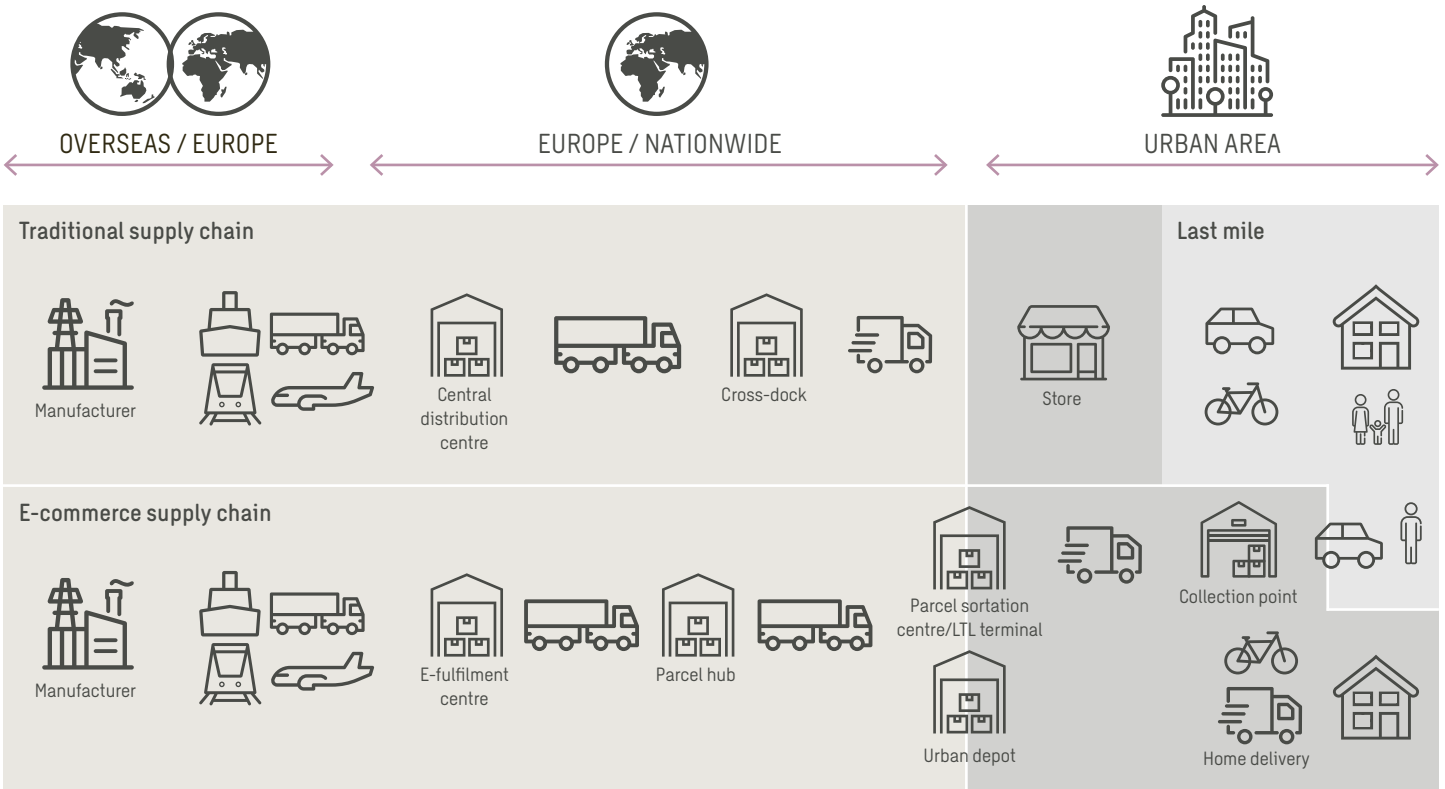


Figure 6. Simplified comparison of traditional supply chains and e-commerce supply chains.

E-COMMERCE OR BRICK-AND-MORTAR?

The distinction between brick-and-mortar⁷ and e-commerce is sometimes blurred – many traditional stores also offer e-commerce options and use their retail points as part of the last mile solution. This increases the complexity and variety of logistics solutions.

⁷) Brick-and-mortar businesses are companies that have a physical presence (e.g., a retail shop in a building) and offer face-to-face customer experiences.

4. SOLUTIONS FOR DELIVERY — THE LAST MILE CHALLENGE IN EUROPEAN CITIES



The citizen stories and statistics presented in section 2 paint a picture of a market undergoing dramatic change – and consumers with varying expectations, preferences and, not least, levels of knowledge. Also, national or local conditions – whether financial, demographic, product-related, technological, societal or legal – will determine which solutions are applied. This diversity is mirrored in the vast array of “last mile” solutions that are currently offered or being developed in European countries. This section presents and describes some of these solutions. Last mile logistics are generally considered the most expensive, least efficient and most polluting part of the supply chain.⁸

In traditional brick-and-mortar purchases, consumers manage last mile transport by taking products home from the store themselves. Some e-commerce last mile solutions also involve the consumer. Some examples are provided in the table below.

Table 1. A selection of last mile solutions.

Last mile solution	Description	Pros	Cons	Sub solutions
Home delivery	Delivery to front door	Convenience for consumer Bulky items possible	Consumer needs to be present at delivery Low fill rate	Delivery Pass
Not at home / car delivery	Delivery inside front door or wherever you are	Convenience for consumer Bulky items possible No need for consumer to be present at delivery	Trust	In-car delivery Smart locks Leave outside front door
Letter box	Delivery as normal mail	No need to be present at delivery	Size limitation	
Collection point / pick-up & drop-off (PUDO)	Delivery to collection point, consumer picks up	No need to be present at delivery Generally long opening hours	Bulky items not possible Capacity limitations	
Parcel locker	Delivery to parcel locker, consumer picks up	No need to be present at delivery No restriction on pick-up time	Bulky items not possible	Personal / residential parcel boxes
Click and Collect	Consumer collects at store	Included in normal logistics solution Avoid in-store crowds	Requires trip to store	Click and Drive



Figure 7 (left). Home delivery is the preferred delivery mode in many countries.



Figure 8 (middle). Smart locks enable home delivery when recipient isn't at home. Source: PostNord.



Figure 9 (right). Products purchased online can now be delivered directly to the boot of your car. Source: PostNord.

HOME DELIVERY

Home delivery is the preferred delivery mode in many countries. Home delivery is convenient for the consumer but has some negative aspects that can make this type of delivery costly, including transport inefficiency (due to low fill rates) and high levels of van traffic. A van can make 30–100 parcel deliveries in an urban context during an 8-hour work shift.⁹ Failed deliveries (when the recipient is not at home) are common and add to handling time, cost and traffic.

SMART LOCKS FOR IN-CAR OR IN-HOME DELIVERY

Solutions for delivering products purchased online directly to the recipient's car are already on the market – e.g. Volvo's In-car Delivery. The car is opened with a digital key, the product is placed in the boot, the car is relocked, and the recipient is notified that the product has been delivered to their car. Delivery can be made during off-peak hours and is very convenient for the car owner. The downside is that the recipient needs to own a car.

A similar option is to have deliveries placed inside the recipient's front door using a smart lock,¹⁰ or putting groceries in the fridge.¹¹ Both of these solutions are also available on the market.

INCREASED CUSTOMER LOYALTY IN THE UK WITH INTRODUCTION OF DELIVERY PASSES

Over the past few years, several major online retailers in the UK have introduced Delivery Passes¹² – membership schemes that offer members “free” home deliveries. Customers often pay a monthly or annual fee, and prices may vary for peak and off-peak deliveries. For groceries, there is often a minimum amount that must be spent to qualify for free home delivery. Nearly all large online grocery retailers have introduced Delivery Passes, with the best known being Amazon Prime. Amazon also offers Delivery Pass customers a better service level, free same day delivery, where available.

This solution demonstrates customers' willingness to pay for these services and will likely increase consumers' use of the home delivery option.

Figure 10. Example of what to expect of a Delivery pass.

Book your delivery, maximum one a day.

Choose your slot for delivery.

There is a minimum order value.

One hour delivery slots are common.

8) Goodman, 2005; Onghena, 2008; European Commission, 2011; LET, 2006.

9) International seminar: Opportunities for sustainable e-commerce deliveries in cities via pick-up points by Ivan Caldenas, https://www.dagenshandel.se/article/view/340021/smaskalig_citylogistik_kan_reducera_utslapp_med_90_procent
10) <http://www.ehandel.se/PostNord-i-ny-storsatsning-pa-leverans-innanfor-dorren,10033.html>
11) <http://www.ehandel.se/ICA-och-PostNord-tar-sig-in-i-ditt-hus-och-levererar-till-sa-kylen,7679.html>
12) An analysis of online shopping and home delivery in the UK, J. Allen et. Al. 2017

CLICK AND COLLECT IN STORES

Click and Collect refers to when the customer orders online and opts to pick up their purchase at a physical shop. In the UK, Click and Collect solutions are far more common than pick-up & drop-off (PUDO), most likely because they are often free of charge.¹³ One benefit with this solution is that online orders can piggyback on the logistics solution used by the store for other delivered items. Click and Collect is therefore cost effective for the retail chain and convenient for the consumer in the sense that they have secured the products they want. However, there are clear inefficiencies if Click and Collect logistics is totally separated from the normal store supply chain.

CLICK-AND-DRIVE FOR GROCERY

France has one of the world's leading online grocery markets. Some retailers introduced drive-through collection services as early as 2004. The model was successful and has expanded rapidly – in 2014 there were over 3,000 drive-throughs¹⁴ and many supermarket chains offer this service today. Surveys shows that French consumers value drive-through pick up service for groceries because it helps them save time and control their grocery budgets.¹⁵ This kind of shopping behaviour is reliant on the car and involves the same trip as going into the store for shopping.

Figure 11. Click and collect in store.



NORDIC COUNTRIES HAVE A WELL-ESTABLISHED NETWORK FOR PARCEL PICK-UP AT COLLECTION POINTS

Large forwarding companies and couriers have built up a network of collection points for parcels. For instance, Sweden and Germany have well developed systems of such centres, offered by several forwarders.¹⁶ One collection point can be used by more than one forwarder. They are often integrated into service shops with long opening hours. It can be petrol stations and grocery stores or such and therefore not designed for the logistics functions. The benefit of this type of solution is that the parcel can be delivered even if the customer is not at home. Forwarders benefit from the option of joint delivery at a service station with generous opening hours. Return flows can also be handled

13) An analysis of online shopping and home delivery in the UK, J. Allen et. al. 2017
14) <https://ecommercenews.eu/click-drive-extremely-popular-in-france/>
15) <https://www.funglobalretailtech.com/research/deep-dive-online-grocery-series-france-click-drive-king/>
16) <http://www.ehandel.se/Samarbete-ger-tillgang-till-26-000-paketombud,5695.html>
https://www.dpd.com/de_en/sending_parcel/our_options/parcelshop_delivery
Interview with Magnus Markgård, DBSchenker 2017-11-13
<https://gls-group.eu/EU/en/parcelshops>

through the collection point. However, during peak shopping periods such as Christmas, the service centres can become overfilled with parcels waiting to be collected by customers.¹⁷

This solution can accommodate increased e-commerce volumes, either by adding collection points or by developing existing and new ones for larger volumes and efficient handling.

PARCEL LOCKERS

Parcel lockers are another alternative for receiving and shipping parcels. This solution is quite cost effective, as it is fully automated and does not need to be staffed. The lockers can be situated either indoors or outdoors, and are often located where there is a lot of pedestrian traffic (e.g. shopping malls and subway stations). If the network is dense and consumers have the option of choosing the delivery site, this solution is relatively convenient for consumers.

Some blocks of flats have boxes for deliveries of small parcels. In Germany, DHL offers households their own individual parcel box for a monthly fee or one-time cost.¹⁸ Parcels are then delivered all the way to the consumer's home, with no need to pick parcels up elsewhere.

The capacity and agility limitations of these types of solutions become apparent as volumes increase and a broader range of product categories is being purchased online (e.g. bicycles and furniture). Particularly in the context of large multi-storey/skyscraper blocks of flats, this solution will most likely prove to be insufficient.

Figure 12 (left). Typical layout of parcel storage at a collection point. Source: TT.

Figure 13 (middle). In 2014 there were over 3,000 drive-throughs in France.

Figure 14 (right). German parcel locker station. Source: DHL.



17) <https://www.postnord.com/sv/media/pressmeddelanden/postnord-sverige/2017/postnord-ber-om-hjalp-hamta-dina-paket-hos-ombudet-nu/>
18) <http://postandparcel.info/61120/news/innovation/dhl-hails-household-parcel-boxes-greatest-development-since-mailbox/>

5. EFFECTS OF INCREASED E-COMMERCE



This section presents an overview of established and anticipated effects of an increase in e-commerce. Research findings from recent years suggest that an increase in e-commerce will indeed produce both positive and negative effects for urban areas – effects that are complex and not yet easily measurable.

Figure 15 maps identified trends through to plausible consequences or implications for the various supply chain components and/or stakeholders in the urban context, aimed at highlighting the characteristics and effects of current e-commerce distribution.

CITIZENS

From a citizen perspective, the effects of e-commerce may be experienced as less time spent travelling to and shopping in stores along with an increase in packaging waste. An increase of freight traffic in residential areas is plausible. Some early adopters have already opened up their homes for deliveries when they're not at home. Such solutions are anticipated to increase and requires adjustments of citizens properties.

Figure 15. Identified challenges and applicable solutions.

	Packaging and sourcing	Warehousing	Main haul / long distance transports	Hubs / terminals
CHALLENGES	<ul style="list-style-type: none">• Increased use of packaging material• Increased waste, waste management and transportation• Management of unique parcel units through the supply chain	<ul style="list-style-type: none">• Increase in order-picking drives resources, costs, and automation as well as energy needs• Amount of returns received further increases complexity and cost	<ul style="list-style-type: none">• Parcel rather than pallet transports• Poor filling degree in transportation• Customer's freedom of choice for means of transportation	<ul style="list-style-type: none">• Increasing volumes in parallel channels• Higher handling / buffering / sortation capacity required• Short lead times call for urban location, closer to delivery points
SOLUTIONS	<ul style="list-style-type: none">• Reduced (ideally no) packaging material (product packaging equals transportation unit)• Recycling / return packaging concepts• Packaging for volume efficiency and robustness in handling• Fewer or no adaptations for the aesthetic aspect / sales exposure	<ul style="list-style-type: none">• Modified warehouse functionality. Layout and automation for order-picking• More urban localisation to shorten lead times and reduce negative impact of poor fill rates	<ul style="list-style-type: none">• Proximity to urban areas become important• Multiple transport solutions may require horizontal collaboration	<ul style="list-style-type: none">• Urban location, closer to delivery points• Co-ordination / co-location of various flows through hubs and collection points• Potentially, co-location of today's hubs, collection points, grocery stores and urban warehouses into an all-in-one facility!

Retail points	Pick-up / collection points	Local distribution	Recipient properties / delivery points
<ul style="list-style-type: none">• Reduced volumes• Reduced cost effectiveness	<ul style="list-style-type: none">• Logistics only secondary focus (convenience stores/kiosks)• Not designed for larger volumes• Inefficient and unreliable operation	<ul style="list-style-type: none">• Poor fill rate due to short lead times and many delivery points• More home deliveries lead to increased traffic load• Negative environmental impact• Environmental awareness	<ul style="list-style-type: none">• Currently no logistics capacity• New needs for receiving and storing parcels and food products• Blocks of flats – important volumes
<ul style="list-style-type: none">• Fewer local stores• New types of retail points – showrooms• Conversion to or combination w/pick-up point	<ul style="list-style-type: none">• Larger size and modernised / purpose-built facilities• Potentially, co-location of today's hubs, collection points, grocery stores and urban warehouses into an all-in-one facility!	<ul style="list-style-type: none">• Horizontal collaboration may increase transportation efficiency• Co-location into an all-in-one urban e-com logistics facility• Alternative distribution vehicles (preconditioned on urban warehouse or hub)	<ul style="list-style-type: none">• Delivery boxes• Porter/receptionist functions• Smart locks• (Logistically!) purpose-designed houses

SUPPLY CHAINS

Consumers' new purchasing behaviour and demands are, as we can see, sometimes far from beneficial for supply chain efficiency and therefore do not always promote a sustainable society. In meeting these new demands, the retail supply chain is facing a potential paradigm shift.

Warehousing operations are profoundly affected by e-commerce, as single items need to be stored, handled, packaged, and delivered and return flows need to be managed.

Inefficient solutions and poor fill rates in last mile distribution are common. The growth of e-commerce risks increasing traffic load from distribution vehicles and regional road transports. For parcel deliveries, time is the constraint on achievable fill rates. Increased demand for short delivery times makes it even more difficult to achieve a high fill rate, as logistics companies cannot consolidate as efficiently. E-commerce also involves increased energy use for packaging and product returns.

In practice, returns mean additional transports and handling throughout the entire reverse supply chain. Increased return volumes also add new complex functionality for the retailer: processes, space and equipment for receiving returns, quality checks to determine whether the goods are resalable, repackaging, and finally reintroduction into the warehousing system to prepare the goods for redelivery.

An intra-urban positioning of logistics hubs, relatively close to the end delivery point, will decrease the traffic load and support the use of more sustainable transport modes. The new needs and expectations generated by e-commerce serve to move the supply chain's "centre of gravity" closer to the consumer. Today's footprint of warehouses, terminals and collection points may alter considerably as a result of this.

The increased volume of home deliveries, combined with consumers' wishes not be tied into a delivery window, also places new demands on the logistics interface in individual homes.

URBAN AREAS

Effects of e-commerce are expected to be different for different areas. For example, increased home delivery frequency will lead to an increase in freight traffic in residential areas – and as deliveries increase, there will be greater demand for parking spaces for delivery trucks.

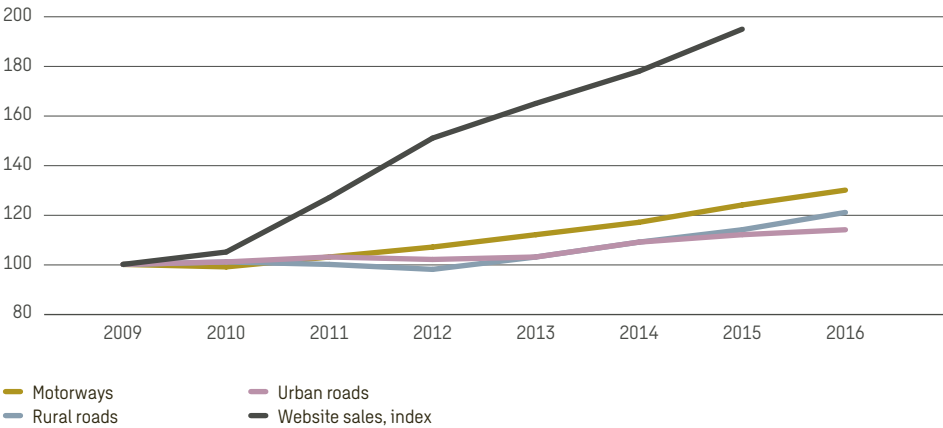
Interestingly however, e-commerce in the US doubled between 2007 and 2013, while urban freight traffic levels remained more or less constant.¹⁹ This apparent decoupling effect may be due to greater logistics efficiency and capacity, although e-commerce still constitutes less than 10 per cent of total US retail trade.²⁰ Meanwhile, in the UK, the use of light commercial vehicles has increased steadily over a long period of time. This may be due to the increase in e-commerce, as well as tax regulations and licence requirements (see Figure 16).

19) <http://cityobservatory.org/growing-e-commerce-means-less-urban-traffic/>
20) https://www.census.gov/retail/mrts/www/data/pdf/ec_current.pdf

An increase in e-commerce should intuitively lead to a decrease in brick-and-mortar shopping and, likewise, in personal travel. It has been argued that brick-and-mortar closures in the US are not a consequence of e-commerce, but rather representative of a structural shift in consumer preference and purchasing power.²¹ A decrease in brick-and-mortar revenue for consumer durables has been seen in Sweden.²²

The effect of increased e-commerce on traffic and infrastructure remains unclear, as mobility chains are complex and the area is relatively new. The effect may be smaller than expected. A study²³ that compared energy use in e-commerce supply chains with traditional brick-and-mortar operations concluded that the net effect of energy consumption was positive for the e-commerce alternative, compared with conventional supply chains, in most of the cases studied. The energy saved in personal travel to and from brick-and-mortar stores was greater than the increase in freight transport energy expenditure for e-commerce. Nonetheless, the last mile transport is the most inefficient part of the supply chain. Increased urban freight traffic directs focus to potential for efficiency improvements as well as requirements for off-loading zones for delivery trucks in urban areas.

Figure 16. Development of UK e-commerce and light commercial vehicle traffic (<3.5 tonne). Source: Office for National Statistics and Department for Transport statistics.



21) <https://www.forbes.com/sites/forbestechcouncil/2017/06/30/the-e-commerce-paradox-brick-and-mortar-killer-or-is-it/2/#7ad9cde24c6a>
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6. CHALLENGES AND SOLUTIONS FOR THE INTEGRATION OF E-COMMERCE IN CITIES — CONCLUSIONS AND RECOMMENDATIONS



Increasing e-commerce is challenging our supply chains. The existing supply chain designs are complex and undergoing dramatic development. Many supply chains are not adapted or optimised for the anticipated increase in services and volumes. The key challenges in urban areas are the resources required, environmental and cost efficiency of last mile transport and the location and function of facilities (hubs, depots, collection points or homes). These challenges resonate throughout the supply chain and in urban planning.

CITIZEN PERSPECTIVE

From a citizen perspective, e-commerce adds convenience and offers consumers a broad range of products. While individual travel needs and purpose of travel are affected by e-commerce, many trips will continue to be taken – although with a potential shift in travel modes. Delivery options are abundant and can sometimes be selected based on preference. There is generally a limited willingness to pay for delivery. Some solutions place demands on people to adapt their homes or behaviour. Generally, though, citizens are not aware of the impact of e-commerce on supply chains, the environment or urban areas.

SUPPLY CHAINS

The need for efficient logistics solutions extends across the spectrum – from warehouse design and location, delivery networks of hubs, depots and transportation, to and into consumers' private homes. Smart packaging solutions that improve fill rates, reduce waste, and enable recycling and re-use are a natural part of efficient logistics.

The inefficiency of today's solutions highlights the need for innovative thinking to identify solutions for efficient distribution principles and supply chain strategies and design, integrated into urban structures. Stakeholders throughout the supply chain will benefit by looking beyond their current boundaries and interests to search for efficient solutions through collaboration, co-ordination, co-location and co-transportation.

PUBLIC AUTHORITIES AND URBAN AREAS

E-commerce affects urban areas, and the impact will become more and more apparent as volumes continue to increase. Incorporating new trends and needs into urban planning and design will benefit citizens as well as e-commerce businesses.

Stakeholders in urban logistics and those responsible for land and property planning need to be coordinated as future requirements are specified for urban logistics facilities' location and function as well as ensuring adequate domestic logistics reception capability and capacity. Logistics facilities will have different requirements for space and location as compared with more traditional set-ups.

Authorities and other powerful stakeholders can promote and support new ideas and new thinking regarding the development of solutions for efficient distribution principles and supply chain strategies and design. Authorities can also inform citizens about the impact of e-commerce on urban areas. Logistics therefore needs to be given high priority on the regional political agenda, and authorities can guide development through regulations and incentives to steer development in a desirable direction.



7. INTERVIEW WITH PROFESSOR MICHAEL BROWNE

URBAN SPACE IS REQUIRED FOR E-COMMERCE-RELATED LOGISTICS ACTIVITIES



PROFESSOR MICHAEL BROWNE, University of Gothenburg, is committed to engaging practitioners and policy-makers with the research community to focus on all logistics aspects that impact on future patterns of urban goods transports and logistics. We had the opportunity to interview him during the writing of this report, and have summarised his statements.

It is tempting to generalise about the way increasing e-commerce and home delivery will influence urban life for citizens and current last mile solutions in Europe. People in different countries generally exhibit similar behaviours, but the effect on the city functions varies depending on how the last mile is organised. In Sweden, a lot of things are distributed to “collection points”; in the UK there is a strong focus on home delivery; and in France it is popular to order online and drive to the store – “Click and Collect”.

Last mile solutions are becoming more challenging with the continued increase in shorter transport time, especially in competitive markets. This involves small volumes and if you look at trip numbers, a lot of trips. Add to this more diverse destination points (offices, homes, collection points, etc.) and you will get more fragmented flows. It is hard to see a development towards a higher load factor. The result will probably be more vans in residential areas. The operators themselves are looking for opportunities, for their system to serve/consolidate the last mile. Cities have started to look at this matter as well. It is therefore expected that cities will be considering whether there are options for changing regulations (or increasing them) in order to encourage/reinforce increased consolidation.

Citizen awareness about how shopping patterns influence the urban environment will be an important factor in creating sustainable last mile solutions. If you make people aware that their consumer behaviour drives transports and make them understand that they are a part of the city, they may choose more environmental friendly transport modes.

Food is not big in e-commerce, but if it grows it will be a significant and recurrent flow. In e-commerce, there is a big difference between food products and non-food products. You are not likely to buy a couple pairs of jeans twice a week, but for food it is different. This will have a great impact, since it involves major volumes purchased with regularity.

Retail space in some city areas is in decline. The mid-range city mall at the outskirts or outside the city is struggling. But more up-market malls in city centres are doing well. The city centres are not likely to be dead zones in 10 years' time – rather, retail space will probably be re-invented. The physical building will stay the same, but traditional shops might be replaced by showrooms.

Urban space for logistics activities will play a more central role. Traditionally, logistics spaces have been forced out from the cities. But if you want to move away from fragmentation of transports, smaller, more urban terminals are part of the solution. In Paris, they have started to set aside land for city logistics. In London, on the other hand, you have central terminals on the River Thames that are safeguarded and not in use. The land-owners are holding the land for future residential development.

Buildings need to be adapted and constructed with more than one thing in mind. Models for sharing space in a better way are needed for tomorrow's dense cities. If a space is not in use for a six-hour period, it may be possible for another actor to use the area. Office buildings nowadays are home to multiple offices, which means that many small deliveries are made to each separate office. The situation can be solved on an organisational level, with the companies setting up a space for efficient loading or unloading.

Professor Michael Browne's research focuses primarily on urban goods transports. He also provides academic leadership for the Urban Freight Platform, a joint University of Gothenburg and Chalmers initiative supported by Volvo Research and Education Foundations (VREF). Read more about Michael Browne here: https://www.gu.se/english/about_the_university/staff/?language-Id=100001&userId=xbromi

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