

Key factors for last-mile delivery from the perspective of e-customers

The research is a part of the project under the title, ***Sustainable city logistics of last mile delivery and returns on the e-commerce market. Various groups of stakeholders' perspective***, which is being financed by the National Science Centre in Poland granted on the basis of the decision number 2018/31/B/HS4/03711.

Agenda

Global e-commerce growth

LM delivery problem & its impacts

Research description

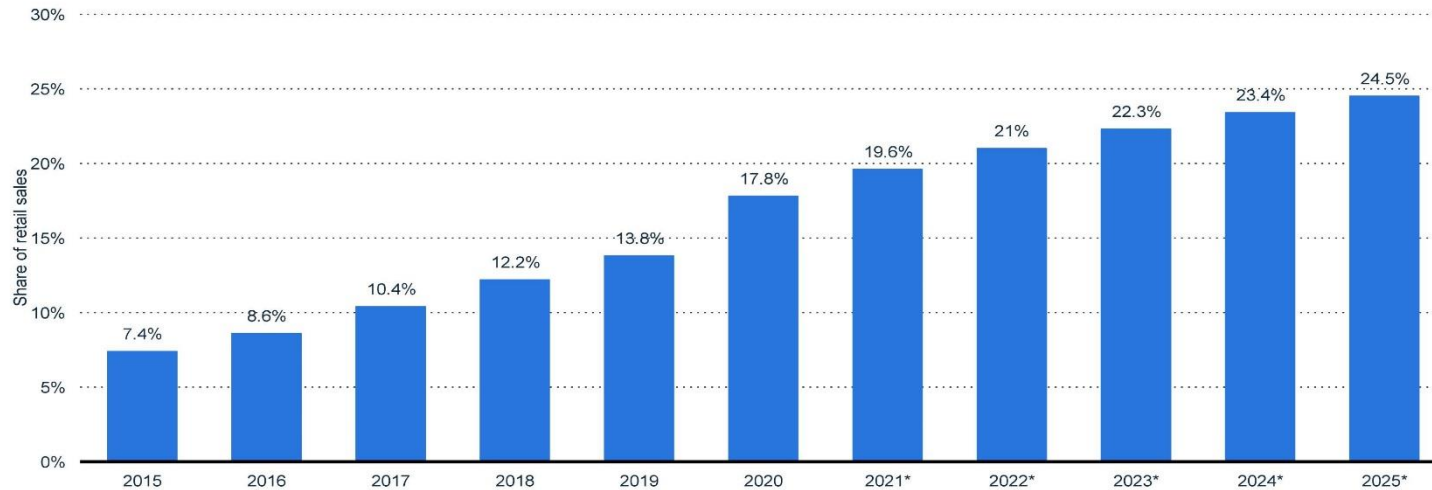
Identified desk research findings

Results of conjoint analysis

Conclusions

E-commerce as percentage of total retail sales worldwide from 2015 to 2025

E-commerce as share of total retail sales worldwide 2015-2025



Note(s): Worldwide; 2015 to 2020

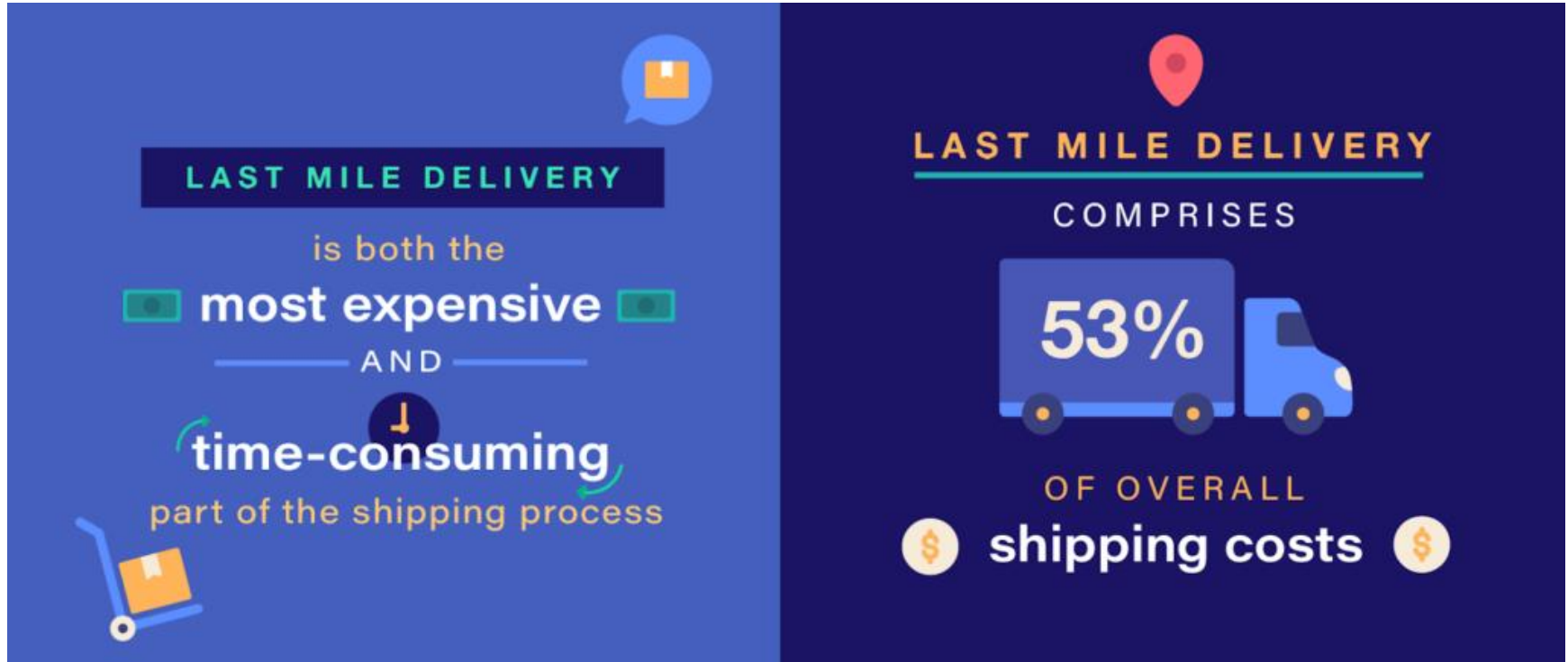
Further information regarding this statistic can be found on [page 43](#).

Source(s): eMarketer, [ID_534123](#)

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Trade **statista**

LAST MILE DELIVERY



Source: optimoroute.com/last-mile-delivery (retrieved: 13.05.2021)
The Last Mile Sprint: State of Mobility in Transportation and Logistics

IMPACTS

Until 2030 in 100 cities globally

- Congestion up 21%
- Emissions by 32%
- Late deliveries
- Increasing costs
- Decreasing safety
- Noise

Source: <https://www.weforum.org/reports/the-future-of-the-last-mile-ecosystem>

CLEANER TRANSPORT



#EUGreenDeal

**REDUCE CAR EMISSIONS
BY 55% UNTIL 2030**

**NEW CARS SHOULD EMIT
ZERO CO₂ BY 2035**

**SUSTAINABLE FUELS
FOR PLANES AND SHIPS**



Question:

What are the key factors for last mile delivery on e-commerce market from the perspective of e-customers ?

Method:

Desk research

Survey with conjoint analysis



Literature review

Database	Scopus, WOS
Analysed fields	Title, abstract, keywords
Search phrase	<p>“last-mile” & “customer behaviour”, “last-mile” & “customer expectations”, “last-mile” & customer & environmentally, “last-mile” & customer & infrastructure, “last-mile” & customer & safety, “last-mile” & customer & green, “last-mile” & customer & social, “last-mile” & customer & flexibility, “last-mile” & customer & close, “last-mile” & customer & “fast delivery”, “last-mile” & customer & “carbon footprint”, “last-mile” & customer & “pick-up point”, “last-mile” & customer & “parcel locker”, “last-mile” & “lower price”, “last-mile” & “ free return”</p>
Number of papers	65
Language	English
Source type	Peer-reviewed journals

Two steams of research

1. reflecting the customer opinion on a particular mode of sustainable last-mile delivery

- parcel lockers - in various geographical locations such as Poland (Lemke et al., 2016), Austria (Hofer et al., 2020), Australia (Lachapelle et al., 2018), Brazil (Oliveira et al., 2017), Italy (Iannaccone et al., 2021), Singapore (Lin et al., 2020; Wang et al., 2018a)
- Crowd shipping (H Buldeo Rai et al., 2018; Punel & Stathopoulos, 2017; Serafini et al., 2018) - price is not the primary motivator, size matters
- Bikes and hubs(Hagen & Scheel-Kopeinig, 2021)
- Drones (Goodchild & Toy, 2018; Yoo et al., 2018)
- Autonomous delivery vehicles (ADVs) – (Kapsler & Abdelrahman, 2020)



Two steams of research

The second stream of research focuses on customer preferences
(Caspersen et al., 2021; Sebastian Kapser & Abdelrahman, 2020; Yuen et al., 2019)



The list of attributes that influence the customer preferences and behaviour in terms of sustainable last-mile delivery – literature review

Dimension	Attribute	Context
Cost	Price	Top criterion among parcel locker users in selecting a service provider
	Free delivery/return	Consumers are willing to wait longer or collect orders themselves in exchange for free delivery or return.
	Willingness to Pay more than the standard price	1. Consumers' willingness to pay (WTP) for climate-friendly last-mile deliveries through reduced or no CO2 emissions from the delivery 2. Only 36% are willing to pay to use the micro-hub
Delivery date	Customised delivery date and location	The third criterion of selecting a delivery provider Possibility to plan the delivery date and its schedule has the highest impact on consumers' utility depending on the customer segment
	Fast delivery and date/ time indicated by the customer	Second most important criterion among parcel locker users in selecting a service provider
Convenience	Location - distance	Preferable in the vicinity of their homes or workplaces or places where it is easy to park
	Possibility of collection by bike or on foot	Second preferred collection method on foot
Environment	Social pressure to act in a sustainable manner	consumer awareness and sustainability-focused (especially environmentally friendly) value orientation have a direct positive influence on responsible consumer behaviour
	Personal environmental awareness	younger and employed urban inhabitants with higher environmental awareness who have already tried alternative delivery are most willing to use micro-hub
	Environmentally-friendly delivery available	consumers are willing to make economic sacrifices if this leads to environmental or social improvements

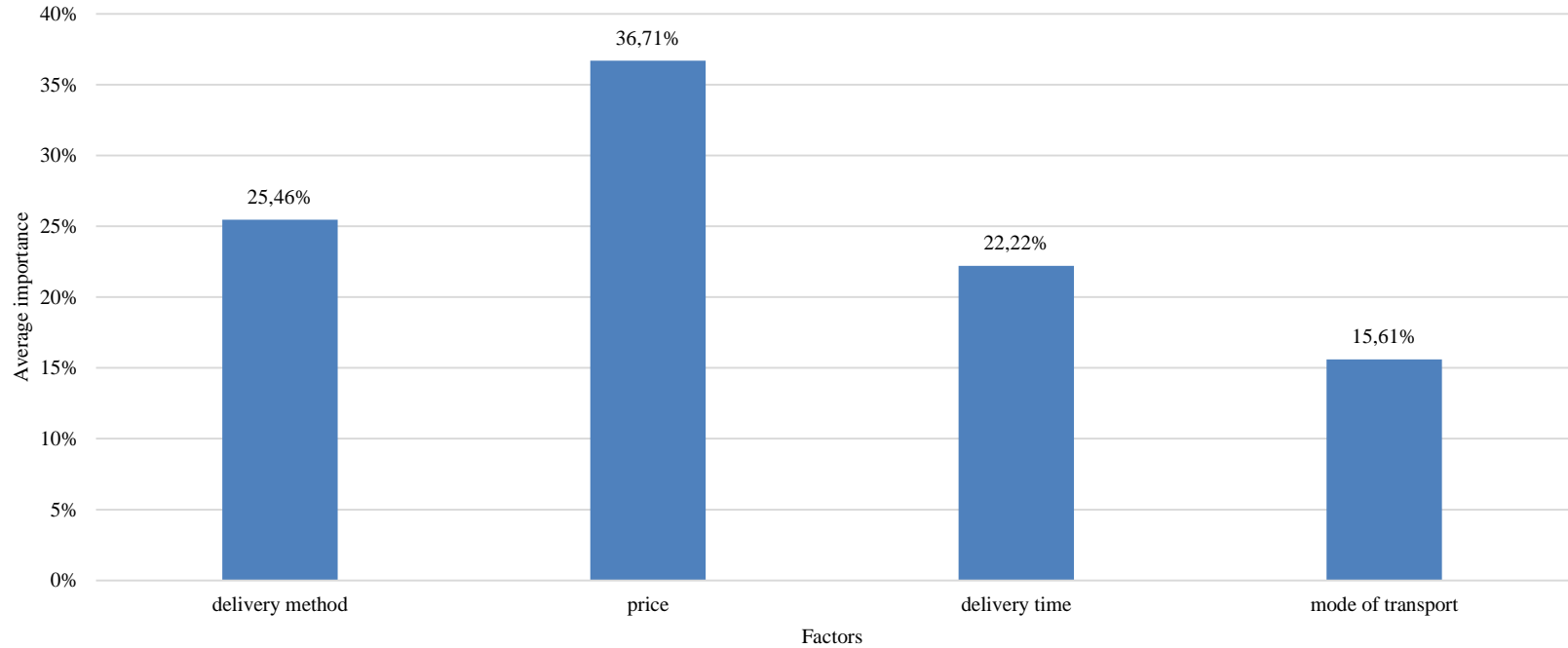
Factors and their levels were used in the design of the research tool.

Factor (criteria)	Levels
Delivery method (3 levels)	<ol style="list-style-type: none">1. Home delivery2. Delivery to the collection point, e.g. Żabka store, PKN Orlen station3. Delivery to a parcel locker
Price (3 levels)	<ol style="list-style-type: none">1. Free delivery2. Standard rate3. Price higher than the standard rate
Delivery date (3 levels)	<ol style="list-style-type: none">1. Standard delivery date2. Customised delivery date, Mon-Fri (Sat, weekend, accelerated, delayed, but within the standard offer),3. Custom delivery: date and time indicated by the customer
Means of transport (2 levels)	<ol style="list-style-type: none">1. Any means of transport2. Ecological means of transport (e.g., electric cars, cargo bicycles, etc.)

Partial usefulness for selected respondents

Factor	Levels	Respondent number			
		1	2	3	4
Delivery method	1. Home delivery	-21.667	-6.111	20.556	-2.444
	2. Delivery to the collection point, e.g. Żabka store, PKN Orlen station	10.333	13.222	-7.778	6.222
	3. Delivery to a parcel locker	11.333	-7.111	-12.778	-3.778
Price	1. Free delivery	-4.667	20.889	44.222	-4.111
	2. Standard rate	11.333	17.889	-3.111	4.556
	3. Price higher than the standard rate	-6.667	-38.778	-41.111	-0.444
Delivery date	1. Standard delivery date	-6.667	12.556	-0.111	5.222
	2. Customised delivery date, Mon-Fri (Sat, weekend, accelerated, delayed, but within the standard offer),	-4.667	-6.778	-21.444	-10.111
	3. Custom delivery date and time indicated by the customer	11.333	-5.778	21.556	4.889
Means of transport	1. Any means of transport	7.500	10.417	7.917	1.417
	2. Ecological means of transport	-7.500	-10.417	-7.917	-1.417

Average importance of factors



CONCLUSIONS



E-customers choices regarding last mile delivery of goods purchased online are driven by price – which turned out to be the decisive factor



Timely and fast delivery and convenience and are also important for e-customers, who decide on the last-mile delivery method.



The respondents prefer ecological means of transportation to conventional (combustion) ones. However, the condition for choosing an environmentally friendly means of transport is free delivery.



Sustainability and in particular environmental protection is not a key factor for e-customers selecting last mile delivery method



The lack of awareness of e-customers about the nature and scope of sustainable last-mile deliveries leads to the choice of a delivery that is not environmentally friendly and generates costs on the courier (or retail company)



Proper labelling and providing information increases the WTP of customers while selecting last mile delivery method for the online purchases.



Thank you listening!

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