

## **THE LAST MILE DELIVERY PROBLEM: A KENYAN RETAIL PERSPECTIVE**

**Eric Mogire**

University of Johannesburg, Department of Transport and Supply Chain Management, P.O. Box 524 Auckland Park, 2006, South Africa, eric\_mogire@yahoo.com (corresponding author)

**Peter Kilbourn**

University of Johannesburg, Department of Transport and Supply Chain Management, P.O. Box 524 Auckland Park, 2006, South Africa, pkilbourn@uj.ac.za

**Rose Luke**

University of Johannesburg, Department of Transport and Supply Chain Management, P.O. Box 524 Auckland Park, 2006, South Africa, rluke@uj.ac.za

**Keywords:** delivery challenge, online retail, e-commerce.

**Abstract:** The article aims to determine the last mile delivery challenges faced by online retailers in Kenya. This is based on the online retailing sub-sector's contribution to the country's economy. Despite its significant contribution to the country's economy, little is known about the challenges facing online retailers during last mile delivery. In other countries such as China and South Africa, that are doing better in online retailing, extensive research has been done to determine unique challenges facing their online retailers during last mile delivery. It is important for the online retailers and relevant government agencies in Kenya to understand the last mile delivery factors that hinder the growth e-commerce. A qualitative research design using face-to-face interviews was used to collect data from seven online retail managers in Nairobi. The findings revealed there are a variety of last mile delivery challenges facing online retailers. These include the lack of a good national addressing system, traffic concerns, security concerns, high cost of delivery, postal service unreliability, and uncondusive county government by-laws. The lack of a good national addressing system was found to be the most common last mile delivery challenge facing online retailers in Nairobi. It is recommended that retailers request their customers to share location details via online map applications such as Google Maps to overcome this challenge. The use of other delivery options, such as customer pick-up points of convenience can also be considered.

### **1 Introduction**

Electronic commerce (e-commerce) has grown at an unprecedented level in recent years. The global e-commerce sales are projected to rise from \$4.248 trillion in 2020 to \$7.391 trillion in 2025 [1]. This is an increase of 74% within a period of five years. In 2022, 50.2% of total global e-commerce sales, which account for more than half, are expected from China. The incredible growth of e-commerce in China, making it a world leader, is attributed to the establishment of a delivery infrastructure that supports express last mile delivery service, among other factors [2]. Despite the strong government support for e-commerce infrastructure in China [3], it is acknowledged that online retailers face some delivery challenges, such as high delivery failure rates due to 'not at home problem.' This means customers are not available at home to receive their ordered goods. Moreover, frequent time window changes due to unpredictable delivery routes have complicated the timely delivery of goods to shared delivery facilities in China [3].

In Kenya, online retailing continues to contribute to the growth of the country's economy. According to the Government of Kenya [4], the retail sector is listed among the six priority sectors aimed at making the country a middle-income country by the year 2030. In addition, Kenya's e-commerce revenue is projected to reach \$3

608.00 million in 2022, compared to China's projected e-commerce sales of \$2 784.74 billion [1,5]. Furthermore, South Africa's e-commerce revenue is projected to reach \$8.74 billion [6]. These figures indicate that even though the online retail subsector contributes significantly to Kenya's economy, the revenue is still quite low by regional and global standards. As in China, Weber and Badenhorst-Weiss [7] acknowledge that online retailers in South Africa face logistical challenges, such as incomplete orders, cold-chain distribution complexities and high cost of distribution. The last mile delivery challenges facing online retailers in these two countries, considered as regional and global e-commerce leaders, are dissimilar.

Despite the significant contribution of the online retail subsector to Kenya's economy, little is known about the last mile delivery challenges facing online retailers. A Statista report [8] on the structure of e-commerce in Kenya found little to describe on delivery characteristics. This means that the Statista report [8] did not find useful results to report on Kenya's e-commerce, including last mile delivery challenges. However, in Google Scholar there were some studies done in Kenya which addressed the service quality issues affecting online shopping [9,10]; factors affecting the adoption of e-commerce [11,12]; and the general or legal challenges facing online retailers in Kenya [13-16]. The studies listed in Google Scholar failed

**THE LAST MILE DELIVERY PROBLEM: A KENYAN RETAIL PERSPECTIVE**

Eric Mogire; Peter Kilbourn; Rose Luke

to examine the last mile delivery challenges facing online retailers in Nairobi. Moreover, Kenya's e-commerce lacks a reliable, low-cost delivery service [17-19]. But there lacks clarity on which components of the delivery service to which this referred. Therefore, there is a need for this study to further investigate the problem, and more specifically to determine the last mile delivery challenges faced by online retailers in Kenya.

A search for journal articles was restricted to peer reviewed journals between 2014 and 2022 using two groups of keywords: delivery challenge/factors and online retail/e-commerce. The keywords were linked by the Boolean OR operator to create a search string for each group. The group search strings were linked by the Boolean AND operator to have combined search strings. Articles that were published in languages other than English were excluded from the search.

Online retailers have been facing numerous challenges while delivering goods to customers. Globally, recent studies suggest that last mile delivery is one of the most expensive and inefficient part of the supply chain [7,20-24]. The high cost of delivery is attributed to complicated and costly handling of returns [7,24]. Moreover, the high cost of returns is a result of making numerous product returns due to the use of cash-on-delivery where customers refuse to pay [21]. In some cases, the high number of returns is caused by dissatisfaction with what is purchased online upon delivery [25].

Apart from costly handling of returns, last mile delivery is associated with high shipping charges [20,22,23]. The high shipping costs result from delivering goods in small quantities, which makes it more expensive to transport [22]. The use of different supply points, such as distribution centres or existing stores to deliver goods to customers also has implications on the cost of last mile delivery [23]. Furthermore, Archetti and Bertazzi [26] argue that the high cost of delivery is associated with explicit requests made by customers for same-day or even next-day deliveries, which end up demanding more transportation resources. This implies that the high cost of delivery is caused by different factors.

Other online retailers suggest that delivery delay is a challenge to them during last mile delivery [3,21,27,28]. The delivery delays can be attributed to unpredictable delivery routes, which complicate delivery time to shared delivery facilities [3]. A study by Janjevic and Winkenbach [28] indicate that delivery delays are caused by traffic congestion and the poor quality of roads in urban areas. Lack of traffic discipline was also found to be a common occurrence in many cities in developing countries [29]. Furthermore, some places remain inaccessible for e-commerce companies due to the absence of good roads, affecting delivery time [25]. This shows that delivery delays can be caused by different factors.

Gopal and Miguel [22] argue that last mile delivery is known to be one of the most polluting aspects of the supply chain. This is attributed to the many delivery trips that are

made which cause air and noise pollution [22]. In Germany, e-grocery retailers find it difficult to deliver because of local emissions from delivery vehicles [30]. To reduce local emissions related to distribution, Ehrler, Schoder and Seidel [30] found that some e-grocery retailers had started using electric vehicles. In Ukraine, light commercial vehicles and intermediate light commercial vehicles have also been recommended for use in reducing emissions on roads [31]. This means that there exists a variety of approaches used to reduce emissions from delivery vehicles. Therefore, retailers must balance customer satisfaction and the environmental impact of their actions since consumers are becoming more aware of global climate change.

The other complications during delivery can be attributed to the lack of a cold-chain delivery [7,23,28,30]. The authors noted that there were few providers of cold chains for perishable products, such as fresh food, especially in some urban areas and other far areas. In some urban areas, online retailers experienced complications during delivery because of security concerns and restrictive policies, such as low emission zones and restricted areas for a specific size of vehicles [28]. Security concerns in an area impact distribution service, particularly in emerging markets [28]. For example, an unattended home delivery method is rare in emerging markets due to the many security incidents that are reported, unlike in the United States of America (USA) and other mature markets, which have few incidents [28].

The lack of proper street addresses also makes it time consuming when doing delivery [21]. In India, Bhattacharya and Mishra [25] established that e-commerce operators find it difficult to deliver goods to their customers due to the unique postal addresses. They also noted that India's administrative divisions based on blocks and sub-blocks cover large geographical distances which cause complications during delivery.

In Kenya, it was noted that lack of a working national addressing system has made it difficult to deliver items to customers' homes [17,32,33]. This has made it more challenging for online retailers to deliver goods to the actual locations of customers. In addition, Kenya's e-commerce lacks a reliable, low-cost delivery service [17-19]. This can be attributed to the non-functioning postal system in Kenya [19,34]. This leaves online retailers to operate their own delivery motorbikes, which increases the cost of doing business [34]. Furthermore, Nielsen [35] reported that 70% of Kenyan online shoppers are not willing to shop online again due to extra delivery charges. In contrast, the European countries doing well in e-commerce have used their public postal corporations to improve delivery reliability and reduce the cost of delivery [19].

From the above literature review, online retailers are facing several last mile delivery challenges, including high cost of delivery; delivery delays; complex handling of returns; cold-chain delivery constraints; poor roads and

traffic concerns; unreliable postal delivery service; non-conducive urban policies; security concerns; and environmental concerns, such as pollution. This leads to the following proposition.

*Proposition 1: There are multiple challenges that online retailers face in offering last mile delivery service.*

## 2 Methodology

A qualitative research design was used to determine last mile delivery challenges faced by online retailers in Nairobi. According to Leedy, Ormrod and Johnson [36], a qualitative research design aims to collect textual data from an informative small sample, analyze data subjectively, and communicate findings using narratives. A qualitative approach was ideal to enable the collection of in-depth qualitative data from the small number of online retailers that are found in Nairobi County.

Given that there exists no official database of online retailers in Nairobi, a Google search was used and a total of 44 online retailers were found [37]. The 44 online retailers were used as the target population. Seven online retailers were sampled from the target population to allow for an in-depth data collection. This was based on the assertion that the minimum sample size for in-depth interviews is six for data saturation to occur [38,39]. The seven online retailers were purposively selected, to ensure that each of the five product categories mostly bought online in Kenya were represented in the final sample size [40]. The five product categories are: toys; furniture and appliances; food and personal care; electronics and media; and fashion.

A semi-structured interview guide was administered using the face-to-face technique to one customer relationship manager or the equivalent manager in charge of customer care for each of the sampled online retailers. The collected data was first transcribed into word processing files and crosschecked for accuracy before it was entered into ATLAS.ti software program to perform thematic analysis. Researchers have noted that thematic analysis helps them to integrate related data from different transcripts and identify key themes or patterns from the data set for further exploration [41].

Validity in qualitative research is concerned with 'credibility' and 'transferability'. 'Credibility' relates to ensuring that socially construed responses match with what respondents intended, while 'transferability' refers to the generalizability of findings [41]. 'Credibility' was ensured by recording the interviews using an audio device for reference on the exact quotes given by managers to authenticate the findings. In addition, the researcher was personally involved in asking questions and capturing the responses in a notebook. The managers were also informed that their participation in the interview was voluntary, and they can seek clarity to any question before responding. 'Transferability' was ensured by having a representative sample that considered the five product categories that are mostly bought in Kenya. 'Dependability' concerned with

reliability in qualitative research [41], was achieved through cross-checking of the codes developed by the researcher. The interviewed managers were also assured of their confidentiality and anonymity to encourage them in giving unbiased information.

## 3 Results

The online retailers that participated in the study were assigned codes as R1, R2, R3, R4, R5, R6, and R7. This was meant to ensure anonymity and confidentiality of the collected information. The findings from the interviewed participants are presented using the following themes.

### 3.1 Lack of a good national addressing system

All online retailers reported that the lack of a good national addressing system made it difficult to offer last mile delivery service. This was because of either some buildings were not numbered, or some streets were not labelled which forced delivery personnel to make calls to verify the exact location of their customers. Some residential areas were congested with buildings which made it difficult to deliver goods to customers. R1 had this to say:

*Honestly, I will say that lack of a proper addressing system is in Nairobi...and that is why you will notice riders will tend to call the customer to confirm exactly where they are...because you might be on this street but then the street has multiple buildings that they need to actually verify that where the customer is exactly*

R5 was of a similar view, describing that:

*... tracing new customers is hectic especially in Eastlands where roads are not labelled well, and buildings congested without any numbers...our delivery crew have to call asking directions*

This implies that the lack of a good national addressing system made it difficult for online retailers in Nairobi to offer last mile delivery service.

### 3.2 Traffic concerns

Traffic concerns were also raised as another challenge experienced by online retailers in Nairobi while offering last mile delivery service. The causes of traffic congestion include ongoing road construction, rain and rush hours experienced in the afternoons. Traffic was found to cause delays in product delivery. R1 noted that:

*...a good example is like currently Mombasa Road right now is under construction together with Waiyaki Way.... traffic is expected in these areas which goes hand in hand together with the level of delay that customers might face...while they want the product to be delivered within promised time.... we try and dispatch most of our goods by midmorning...since that is when the traffic has died down.*

R5 also noted that:

*... traffic congestion in Nairobi is like hell...especially in the afternoons... and also when it rains...we use*

*bodabodas to manoeuvre with traffic jam but still it is a big problem.*

The findings on traffic concerns implies that online retailers in Nairobi were having late deliveries due to traffic concerns. The County Government of Nairobi, the Ministry of Interior and Coordination of National Government, and the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works had failed to manage traffic flow in Nairobi.

### 3.3 Security concerns

The results also indicated security concerns as a challenge faced by online retailers in Nairobi during last mile delivery. Delivery personnel were reported to have been attacked while delivering goods in some informal areas. The attacks were linked to the cash they collected as they delivered goods to customers. It was also noted that some customers had tried to defraud delivery personnel by presenting fake messages as evidence of payment. R4 stated that:

*...security concerns especially on our delivery team, as they make deliveries, they are collecting cash as well...there is always that risk of being attacked by people just to take away the cash...there has been experiences especially in informal areas like Mathare and Kibera...we have lost some cash in those areas.*

R2 also noted that:

*Nairobi, the biggest issue is conmen because we do payment on delivery...and we use m-pesa, airtel money, visa card...so try showing the rider or driver a payment made from m-pesa which is false or fake....so we have had several of those, but we have our own internal system of dealing with this plus insurance for goods in transit.*

Based on the findings on security concerns, it implies that the option of cash on delivery in Nairobi had reported theft of cash, fraud cases involving presentation of fake payment messages, and personal attacks on delivery personnel. This shows that the Ministry of Interior and Coordination of National Government had failed to provide security service to businesses in Nairobi. Furthermore, the Ministry of Information, Communications and Telecommunication (ICT) had failed to protect online businesses in Nairobi from fraudsters.

### 3.4 High cost of delivery

High cost of delivery was also found to be a great challenge during last mile delivery. The high cost of delivery was because transport service providers were consuming more fuel, traffic jams, and the high vehicle maintenance costs caused by the poor state of roads in Nairobi. This forces transport service providers to charge more to stay in business. Moreover, it was reported that some delivery charges exceeded the price paid for the product. R4 noted that:

*...delivery cost to the business now is quite high...the longer you stay in traffic the more fuel you consume, the longer you have to pay the delivery team.... there is also now the aspect of bad roads...the owners of the truck will now charge you much higher because now they have to incur high maintenance costs*

R7 had a similar view and had this to say:

*...actually there are some concerns...sometimes a client maybe wants an item that costs Ksh. 200 and when you check the delivery from your riders...the charge is like Ksh. 300...so, there is some concern*

This implies the County Government of Nairobi, the Ministry of Interior and Coordination of National Government, and the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works had contributed to the high cost of delivery due their inability to manage traffic congestion in Nairobi. Furthermore, the County Government of Nairobi and the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works had contributed to the high cost of delivery by failing to improve the poor state of roads in Nairobi.

### 3.5 Unconducive County government by-laws

The unconducive county government by-laws were also reported among the last mile delivery challenges faced by online retailers in Nairobi. Online retailers reported that law enforcement officers from the County Government of Nairobi harass their delivery personnel even when they have the required parking and distribution licences. R4 noted that:

*...there are a lot of issues with county by-laws especially on parking and the designated parking slots....not all customers have those designated loading zones,... so you are always at crossroads with county askaris despite paying for the licenses and parking fee, our team gets in trouble for parking at a wrong place or doing deliveries at non designated areas...I will give you an example like Parklands area, despite making payments to the county government for parking and distribution licenses, they really harass us that our trucks are not parked at the right spots or we do not have the official sticker of that bay.*

R2 was of a similar view and noted that:

*...of course, we have issues with city council askaris during pickups because most of our sellers are based in the CBD...so they really harass the motorbike riders even though they have licenses.*

From the responses, it implies that the County Government of Nairobi had failed to protect genuine businesses in Nairobi. Delivery personnel were being harassed by law enforcement officers from the County.

### 3.6 Postal service unreliability

The results also revealed that postal service unreliability posed some challenges during last mile delivery. The postal service was found to be inefficient and not able to offer the same day delivery service. It was also reported that the postal service was slow when delivering goods to clients. R7 reported that: “...they are slow...and some clients actually forgotten about postal service.” R1 was of a similar opinion and reported that:

*.... actually, we have had some discussions around postal service...but then we found that it wasn't the right time to utilize postal service. The postal service in Kenya is also undergoing changes internally to ensure they have that efficiency within themselves as well...for example I can't utilize the postal service to deliver for me the same day...because what they have is the next day delivery.*

This implies that the Postal Corporation of Kenya (PCK) had failed to offer reliable and efficient postal service in Nairobi. Most online retailers prefer same day delivery service, which is not offered by PCK.

The results of last mile delivery challenges are summarised in Table 1. Proposition 1 is true as more than one last mile delivery challenge was identified.

*Table 1 Last mile delivery challenges faced by online retailers in Kenya*

<b>Most common last mile delivery challenge</b>	Lack of a good national addressing system
<b>Other last mile delivery challenges</b>	Traffic concerns; security concerns; high cost of delivery; unconducive county government by-laws; and postal service unreliability

#### 4 Discussion

From the responses presented in the preceding section, the lack of a good national addressing system was reported as the most common last mile delivery challenge facing online retailers in Nairobi. The finding revealed that this challenge had made it difficult for online retailers to deliver goods to customers' location. The finding validates results from Communication Authority of Kenya (CAK) [17] and Alushula [32] that found the lack of a working national addressing system in Kenya made it difficult to deliver items to customer's homes. Online retailers reported that streets were not labelled, and buildings were not numbered, making it difficult to deliver goods to customers. In the United Arab Emirates, Ghandour [21] found that the lack of proper street addresses had made it time-consuming and costly for e-commerce firms when offering delivery service. As an alternative, Halldórsson and Wehner [42] found that the use of pick-up points in Sweden enabled delivery service providers to deliver many goods at the same time.

The results also showed that online retailers in Nairobi are having difficulties during last mile delivery because of the unreliable postal service. The postal service in Nairobi was reported to be unreliable and inefficient to the extent of being unable to offer same-day delivery service. In India, a study by Bhattacharya and Mishra [25] reported similar results where online retailers found it difficult to deliver goods to their customers due to huge complications in administrative divisions based on blocks and sub blocks that cover large geographical distance. However, in some countries postal service unreliability is not common especially in countries doing well in e-commerce. For example, Ekekwe [20] argues that Amazon.com and eBay are great e-commerce firms in the USA because they depend on the postal system to serve their customers.

The other last mile delivery challenges facing online retailers in Nairobi include traffic concerns; security concerns; high cost of delivery; and unconducive county government by-laws. It was established that traffic congestion is a great challenge to online retailers in Nairobi when offering last mile delivery services. The findings revealed that traffic congestion led to delivery delays in Nairobi. The causes of traffic congestion in Nairobi were reported as rush hours in the afternoons, rains, and the poor state of roads. The result concurs with CAK [17] that found delivery service in Kenya's e-commerce was unreliable. This is likely to hinder the growth of e-commerce in Kenya. A study by Janjevic and Winkenbach [28] identified traffic congestion as a last mile delivery challenge in urban environments of emerging markets. They suggested that traffic congestion can be resolved by either use of alternative modes of transport or use of different vehicles

The high cost of delivery was also reported as a last mile delivery challenge facing online retailers in Nairobi. The high cost of delivery was partially due to the poor state of roads that increased vehicle maintenance costs. Traffic congestion in Nairobi also led to a high cost of delivery because vehicles consume more fuel. This finding validates CAK [17] that found there was lack of a low-cost delivery service in Kenya's e-commerce subsector. Furthermore, Nielsen [35] reported that 70% of Kenyan online shoppers are not willing to shop online again due to extra charges. If not addressed, this challenge is likely hinder the growth of e-commerce in Kenya. In South Africa, Brink [23] found that high shipping charges are a significant challenge for online groceries in Gauteng. Globally, Ehrler, Schoder and Seidel [30] found that online grocery retailers in Germany face very high costs of delivery. Similarly, Mangano and Zenezini [27] posit that last mile delivery is probably one of the most expensive and complex global supply chain processes. This calls for use of other measures to manage the high cost of delivery. For instance, online retailers should carefully plan their deliveries by offering two slots per week to maximize drop density [30]. However, sometimes online retailers can incur extra cost to fulfil low customer orders [22].

Security concerns were also raised as a last mile delivery challenge facing online retailers in Nairobi. Delivery personnel reported attacks to their managers. The attacks were reported in some informal areas. The attacks were linked to the cash that the delivery personnel collected as they delivered goods to customers. It was also reported that some customers had tried to defraud delivery personnel by presenting fake messages as evidence of payment. This finding is supported by Janjevic and Winkenbach [28] who found the unattended home delivery method was rare in emerging markets, such as Kenya due to high security-related issues. Therefore, security concerns need to be addressed to promote the growth of e-commerce in Kenya. This is supported by a study by Janjevic and Winkenbach [28] which reported that mature online markets, such as the USA have fewer security-related issues that affect the delivery service.

Unconducive county government by-laws in Nairobi are a challenge to online retailers during last mile delivery. It was reported that delivery personnel were harassed by the County law enforcement officers. This is unacceptable and relevant government agencies need to address this to promote the growth of e-commerce in Kenya. A study by Janjevic and Winkenbach [28] identified urban freight policies as a last mile delivery challenge in urban environments of emerging markets. They were of the view that the urban freight policies are subject to restrictive policies applicable in a given e-commerce market, for instance, having low emission zones or restricting the size of vehicles allowed in a given area.

## 5 Conclusions

In conclusion, online retailers in Nairobi face numerous last mile delivery challenges. The main last mile delivery challenge is related to the lack of a good national addressing system. Online retailers mentioned that some buildings in Nairobi were not numbered, and some streets were not labelled, making it very difficult to trace customers' locations during delivery. It is recommended that the online retailers request their customers to share location details via online map applications such as Google Maps for delivery. The use of other delivery options, such as customer pick-up points of convenience, can be adopted by the retailers. The customer pick-up points of convenience engage the online customer in collecting goods from pick-up stations near them. The use of pick-up points in Sweden had enabled delivery service providers to deliver many goods at the same time [42]. Through the Retail Trade Association of Kenya (RETRAK), online retailers should lobby the County Government of Nairobi to ensure all streets are labelled and buildings are numbered. Evidence collected from online retailers also revealed that retailers face other last mile delivery challenges such as traffic concerns, security concerns, high cost of delivery, unconducive county government by-laws, and postal service unreliability. Traffic concerns caused by ongoing road construction in Nairobi, rain, and rush hours

in the afternoons led to delays in product deliveries. It is recommended that online retailers should undertake better delivery planning, such as alternative routing and scheduling at different times to avoid delivery delays. Retailers should consider introducing incentives for off-peak deliveries to encourage customers get their deliveries when there is less traffic. Instead of using delivery trucks, retailers should consider using flexible modes of transport such as motorbikes 'bodabodas' due to their excellent manoeuvrability when there are traffic jams during peak hours. Furthermore, through the RETRAK, online retailers should lobby the County Government of Nairobi, the Ministry of Interior and Coordination of National Government, and the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works to properly manage vehicle traffic situation in Nairobi.

Based on the finding that security was a great concern for online retailers in Nairobi, the study concludes that delivery personnel are at risk of attacks, losing cash, and being subjected to fraud. It is recommended that online retailers adopt either the payment before delivery option or the cashless payment option to reduce fraud cases and losing cash. Retailers can also consider outsourcing security personnel to assist in the delivery of high-value goods. Through the RETRAK, online retailers should also lobby the Ministry of Interior and Coordination of National Government to provide security services during delivery. Retailers can put in place online security systems and measures to prevent cyber-attacks and fraudsters. This involves the use of escrow service, requesting customers to use strong passwords, and setting up system alerts for suspicious customer behaviours.

The study also found that online retailers in Nairobi are experiencing high costs of delivery attributed to high charges from transport service providers. The high transport charges are due to the traffic congestion and the poor state of roads in Nairobi. It is recommended that retailers should use other delivery options, such as customer pick-up points of convenience, to reduce delivery costs. Retailers can also continually optimize delivery routes by analysing historical route data to identify the most efficient routes. Through the RETRAK, online retailers should also lobby the County Government of Nairobi, the Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works to improve the state of roads in Nairobi and effectively manage traffic congestion. This will eventually lead to reduction in the operational expenses of transport service providers.

The finding on harassment from the County law enforcement officers implies that the County Government of Nairobi was not providing a conducive business environment for online retailers. It is recommended that online retailers should document and report all the law enforcement officers found to harass delivery personnel. Through the RETRAK, online retailers should also lobby the County Government of Nairobi to investigate and take

disciplinary measures against law enforcement officers harassing online retailers. Lastly, the finding that postal service unreliability is posing some challenge during last mile delivery, means that online retail managers cannot rely on postal services when doing delivery in Nairobi. It is recommended that online retailers consider using alternative courier service providers that can meet their delivery needs. Through the RETRAK, online retailers should also lobby the PCK to reengineer its delivery services to make them more efficient.

Overall, the findings offer practical implications to the managers and relevant government agencies on the last mile delivery challenges that should be addressed. The retailers can embrace the different managerial strategies recommended in the study to overcome last mile delivery challenges. Additionally, retailers can lobby via RETRAK for provision of essential services whose absence is contributing to the identified last mile delivery challenges. This should lead to the growth of the online retail subsector in Nairobi hence creating more employment opportunities and enhanced economic growth.

Owing to the limited research in last mile delivery service, these findings are a valuable addition to logistics-related research in Nairobi. However, this study was limited to online retailers in Nairobi County. Any generalisations of results to other retailers that are not purely online, to other counties, and other countries should be considered cautiously. A similar study should be conducted in other counties in Kenya to test whether the results are similar. Further research should focus on other countries in Africa which have adopted e-commerce to a great extent, such as South Africa and Nigeria, to provide an opportunity for a comparative study

### Acknowledgement

The authors are very grateful to the Department of Transport and Supply Chain Management for the permission granted to undertake this study. This research did not receive funding from any agency.

### References

- [1] eMARKETER: Global Ecommerce Forecast: As 2-Year Boom Subsides, Plenty of Bright Spots Remain, [Online], Available: <https://on.emarketer.com/rs/867-SLG-901/images/eMarketer%20Global%20Ecommerce%20Forecast%20Report.pdf> [13 Jun 2022], 2022.
- [2] YI, L.: National Report on E-Commerce in China, [Online], Available: <https://www.unido.org/sites/default/files/files/2018-01/WP16.pdf> [11 Aug 2020], 2017.
- [3] JIANG, L., LIANG, C., DONG, J., LU, W., MLADENOVIC, M.: A disruption recovery problem with time windows change in the last mile delivery of online shopping, *Mathematical Problems in Engineering*, Vol. 2018, No. December, pp. 1-10, 2018. <https://doi.org/10.1155/2018/2096416>
- [4] GOVERNMENT OF KENYA: Kenya Vision 2030: the Popular Version, [Online], Available: [https://theredddesk.org/sites/default/files/vision\\_2030\\_brochure\\_july\\_2007.pdf](https://theredddesk.org/sites/default/files/vision_2030_brochure_july_2007.pdf) [15 Nov 2019], 2007.
- [5] STATISTA: Ecommerce: Kenya, [Online], Available: <https://www.statista.com/outlook/dmo/ecommerce/kenya> [14 May 2022], 2021.
- [6] STATISTA: Ecommerce: South Africa, [Online], Available: <https://www.statista.com/outlook/dmo/ecommerce/south-africa> [14 May 2022], 2021.
- [7] WEBER, A., BADENHORST-WEISS, J.: The last-mile logistical challenges of an omnichannel grocery retailer: a South African perspective, *Journal of Transport and Supply Chain Management*, Vol. 12, No. August, pp. 1-13, 2018. <https://doi.org/10.4102/jtscm.v12i0.398>
- [8] STATISTA: Kenya Statista Country Report, [Online], Available: <https://www.statista.com/study/48451/kenya/> [21 Jun 2020], 2019.
- [9] INDECHE, A.: *Role of online service quality on customer satisfaction: case of online retailing sites in Nairobi, Kenya*, MBA Thesis, United States International University, Nairobi, 2017.
- [10] ONYANGO, C.: *Service quality of Kenyan online shopping services and customer satisfaction*, MBA Thesis, University of Nairobi, Nairobi, 2018.
- [11] WAWERU, E.: *Factors affecting the adoption of e-commerce in Kenya: a case study of consumer perspective in Thika town*, MA Thesis, University of Nairobi, Nairobi, 2019.
- [12] KIMANA, V.: *Factors affecting e-commerce adoption among small and medium enterprises (SMEs) in developing countries: the context of Kenya*, Bachelor's Thesis, Mid Sweden University, Sundsvall, 2020.
- [13] KABUBA, P.: *E-commerce and performance of online businesses in Kenya*, MSc Thesis, University of Nairobi, Nairobi, 2014.
- [14] MUNYALO, R.: *Legal and regulatory challenges facing the growth of e-commerce in Kenya*, LLM Thesis, University of Nairobi, Nairobi, 2016.
- [15] MWENCHA, P., THUO, J., MUATHE, S.: An assessment of the state of e-commerce in Kenya, *East Africa Journal of Contemporary Research*, Vol. 1, No. 1, pp 70-81, 2019.
- [16] OJAL, E.: *A framework for online shopping among postgraduate students during Covid-19*, MSc Thesis, University of Nairobi, Nairobi, 2021.
- [17] COMMUNICATION AUTHORITY OF KENYA: Facilitation and Adoption of E-Commerce via the Postal/Courier Networks, [Online], Available: <https://ca.go.ke/wp-content/uploads/2018/02/White-Paper-on-E-Commerce-Adoption-in-Kenya-April-2015.pdf> [06 Nov 2019], 2015.
- [18] INTERNATIONAL TRADE CENTRE: International E-commerce in Africa: the Way Forward, [Online], Available: <https://www.intracen.com>

**THE LAST MILE DELIVERY PROBLEM: A KENYAN RETAIL PERSPECTIVE**

Eric Mogire; Peter Kilbourn; Rose Luke

- org/uploadedFiles/intracenor/Content/Publications/International%20E-Commerce%20in%20Africa\_Low-res.pdf [02 Jul 2020], 2015.
- [19] UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT: UNCTAD B2C E-commerce Index 2019, [Online], Available: [https://unctad.org/en/PublicationsLibrary/tn\\_unctad\\_ict4d14\\_en.pdf](https://unctad.org/en/PublicationsLibrary/tn_unctad_ict4d14_en.pdf) [11 Jun 2020], 2019.
- [20] EKEKWE, N.: *The challenges facing e-commerce start-ups in Africa*, Harvard Business Review, 12 March, pp. 1, 2015.
- [21] GHANDOUR, A.: *An exploratory study of the usage level of e-commerce among small and medium enterprises in Abu Dhabi, United Arab Emirates*, International Conference on Intelligent Systems, Control & Manufacturing Technology, Abu Dhabi Conference, pp. 32-34, 2015.
- [22] GOPAL, G., MIGUEL, A.: Tackling the difficult last mile: the logistics model gift for your supply chain that keeps on giving, *Industrial & Systems Engineering Magazine*, Vol. 49, No. 12, pp. 28-99, 2017.
- [23] BRINK, B.: *Challenges faced in last mile e-grocery delivery: a consumer perspective*, MCom Thesis, University of Johannesburg, Johannesburg, 2018.
- [24] BIJMOLT, T., BROEKHUIS, M., LEEUW, S., HIRCHE, C., ROODERKERK, R., SOUSA, R., ZHU, S.: Challenges at the marketing-operations interface in omni-channel retail environments, *Journal of Business Research*, Vol. 122, No. January, pp. 864-874, 2019. <https://doi.org/10.1016/j.jbusres.2019.11.034>
- [25] BHATTACHARYA, S., MISHRA, B.: Evolution, growth, and challenges in e-commerce industry: a case of India, *Sumedha Journal of Management*, Vol. 4, No. 1, pp. 45-58, 2015.
- [26] ARCHETTI, C., BERTAZZI, L.: Recent challenges in routing and inventory routing:e-commerce and last-mile delivery, *Networks*, Vol. 77, No. 2, pp. 255-268, 2020. <https://doi.org/10.1002/net.21995>
- [27] MANGANO, G., ZENEZINI, G.: *The Value Proposition of Innovative Last Mile Delivery Services from the Perspective of Local Retailers*, 9<sup>th</sup> IFAC Conference on Manufacturing Modelling, Management and Control MIM, Berlin, pp. 2590-2595, 2019. <https://doi.org/10.1016/j.ifacol.2019.11.597>
- [28] JANJEVIC, M., WINKENBACH, M.: Characterizing urban last-mile distribution strategies in mature and emerging e-commerce markets, *Transportation Research Part A:Policy & Practice*, Vol. 133, No. March, pp. 164-196, 2020. <https://doi.org/10.1016/j.tra.2020.01.003>
- [29] DHONDE, B., PATEL, C.: Identifying the factors inhibiting research on urban freight transport in developing countries: review of studies in India, *Acta Logistica*, Vol. 8, No. 1, pp. 1-10, 2021. <https://doi.org/10.22306/al.v8i1.190>
- [30] EHRLER, V., SCHODER D., SEIDEL, S.: Challenges and perspectives for the use of electric vehicles for last mile logistics of grocery e-commerce—findings from case studies in Germany, *Research in Transportation Economics*, Vol. 87, No. June, pp. 1-9, 2021. <https://doi.org/10.1016/j.retrec.2019.100757>
- [31] GALKIN, A., NAZAROV, O., SHAPOVAL, G., KOLOSOK, V., KHODOVA, Y.: Assessment of the urban freight regulations impact on the transportation cost, *Acta Logistica*, Vol. 9, No. 2, pp. 123-130, 2022. <https://doi.org/10.22306/al.v9i2.279>
- [32] ALUSHULA, P.: *Regulation gaps that leave you exposed when you shop online*, Business Daily, 19 December, pp. 1, 2018.
- [33] JONYO, E.: E-commerce awards Kenya 2019: trust and last mile delivery remain key challenges, [Online], Available: <https://elvisjonyo.co.ke/2019/08/26/e-commerce-awards-kenya-2019-trust-and-last-mile-delivery-remain-key-challenges/> [20 Dec 2019], 2019.
- [34] OMOLLO, D.: *The evolving online ecosystem in Africa and how it is impacting shoppin behaviour*, The Marketing & Social Research Association Conference, pp. 1-19, 2016.
- [35] NIELSENIQ: Nielsen Sets the Scene for Beating the Odds in Consumer and Retail Landscape in Kenya, [Online], Available: <https://www.nielsen.com/ssa/en/press-releases/2019/nielsen-sets-the-scene-for-beating-the-odds-in-consumer-and-retail-landscape-in-kenya/> [26 Oct 2019], 2019.
- [36] LEEDY, P., ORMROD, J., JOHNSON, L.: *Practical Research: Planning and Design*, 12<sup>th</sup> ed., Ney York, Pearson, 2019.
- [37] PINECREST, J.: Online shopping in Kenya, [Online], Available: <https://informationcradle.com/kenya/online-shopping-in-kenya/> [11 Nov 2019], 2019.
- [38] GAY, L., MILLS, G., AIRASIAN, P.: *Educational Research: Competencies for Analysis and Applications*, 10<sup>th</sup> ed., Boston, Pearson, 2014.
- [39] GALVIN, R.: How many interviews are enough? do qualitative interviews in building energy consumption research produce reliable knowledge?, *Journal of Building Engineering*, Vol. 1, No. March, pp. 2-12, 2015. <https://doi.org/10.1016/j.jobe.2014.12.001>
- [40] STATISTA.: Statista County Report, [Online], Available: <https://www.statista.com/studies-and-reports/countries-and-regions?idCountry=404&idBranch=0&idLanguage=0&reportType=0&documentTypes%5B%5D=ppt&documentTypes%5B%5D=pdf&documentTypes%5B%5D=xls&sortMethod=idRelevance&p=1> [28 Aug 2020], 2020.



- [41] SAUNDERS, M., LEWIS, P., THORNHILL, A.: efficiency, *Research in Transportation Business & Management*, Vol. 37, No. December, pp. 1-11, 2020. <https://doi.org/10.1016/j.rtbm.2020.100481>
- [42] HALLDÓRSSON, A., WEHNER, J.: Last-mile logistics fulfilment: a framework for energy

**Review process**

Single-blind peer review process.