

CONSUMER ATTITUDES TOWARDS THE APPLICATION OF GREEN LOGISTICS PRINCIPLES IN THE PARCEL DELIVERY SECTOR

Kristina KAROSEVIČIENĖ, Daiva ČAPLIKIENĖ

Kolping Higher Education Institution, Lithuania

Abstract. Currently, more and more attention is paid to environmental protection and efficient use of natural resources. The need to rethink approaches to the implementation of logistics functions in the presence of the need to protect the environment and increase social responsibility leads to the transformation of companies and the need to evaluate the consumer's attitude to the changing functions of companies and the creation of business strategies that would increase the value for the consumer. The object of the article is the users of the parcel delivery sector. The purpose of the article is to evaluate the consumer's attitude towards the application of green logistics principles in the parcel delivery sector. Objectives of the article: to reveal the benefits of applying the principles of green logistics to companies and the end user. To present the users' perspective on the application of green logistics principles. The article uses the analysis of scientific literature and quantitative research.

Keywords: green logistics, nature protection, parcel delivery, consumers

INTRODUCTION

Companies are becoming more aware of their environmental impact. In order to turn environmental issues into business opportunities, many companies are beginning to consider how environmental or ecological aspects can be integrated into their service offerings (Isaksson and Hüge-Brodin, 2013). The principles of green logistics are based on the triple principle, according to which the environmental, social and economic impact of logistics activities are taken into account, so the benefits accrue to the company, its suppliers and partners, customers and every member of society. Freight transport and business logistics can improve their environmental sustainability through energy efficiency, but the sector has only responded in 2018 by complying with European Union directives and the United Nations Sustainable Development Goals. The pursuit of energy efficiency as a means of achieving environmental sustainability, primarily by reducing the dependence of logistics operations and systems on fossil fuels, remains poorly understood (J. Wehner et al. 2021), but it must be recognized that the broad transport industry, which is greatly affected by emerging fuel prices, more efficient transport means not only a reduction in CO² emissions, but also economic savings. The intensified competitive environment and changed consumer expectations encourage companies to adopt green logistics strategies that would improve operational efficiency, profitability and reduce the carbon footprint. However, when companies make decisions to improve their operations, the quality of the service also changes in the short term, the delivery time of the parcel may increase, the delivery location may change, the price of the service may increase, so it is very important to assess the consumer's attitude as to how much we want and can contribute to the preservation of the nature around us.

The object of the article is services provided to users of the parcel delivery sector.

The purpose of the article is to evaluate the consumer's attitude towards the application of green logistics principles in the parcel delivery sector.

The aims of the article:

1. To reveal the benefits of applying the principles of green logistics to companies and the end user.
2. To present the users' approach to the application of green logistics principles.

Research methods: The article uses the analysis of scientific literature and quantitative research. The questionnaire survey method was used to perform the analysis of the quantitative assessment of consumer attitudes

THE IMPORTANCE OF APPLYING THE PRINCIPLES OF GREEN LOGISTICS

Green logistics is a calculation and application concept to reduce the environmental impact of logistics activities, which has become an inevitable trend. If companies do not quickly implement the greening criteria of the sector, they may be pushed out of the competitive market in the future. Greening the logistics sector and implementing green logistics principles in business will help companies meet environmental criteria, increase competitiveness and achieve comprehensive and sustainable development and growth. Also, the implementation of these principles increases the image of the company, improves its name, and it should be mentioned that in this period environmental management is already an indicator of quality and reliability all over the world.

One of the main sources of environmental problems related to logistics is transportation and all operations related to the transportation process. This results in increased air pollution, fossil fuel consumption, increased risk of accidents and congestion on the road network in some regions. Transport accounts for 90 percent. logistics-related pollution in the greenhouse gas emission segment.

Globalization has led to fundamental changes in the way consumers and businesses operate, related to the facilitation of trade between different countries or the ability to buy products without leaving home. In fact, more and

more European consumers are adopting e-commerce every year. trade practice - 2021 74 percent of internet users shopped online (Silva, Amaral and Fontes, 2023). Lithuanian consumers did not stand out either. A study commissioned by Swedbank found that in 2021 even 85 percent population used e-commerce services.

According to the data of the official statistics portal in Lithuania in 2022. 38.9 percent of companies carried out by e. trade, i.e. i.e. sold goods or services over computer networks. 37 percent companies sold goods or services online and 5.2 percent. – using electronic data interchange. E-commerce was carried out by 58.9 percent. large companies, 46.6 percent. – average, 36.4 percent. - small ones. The largest part of the companies that carried out e. trade, there were companies engaged in trade activities, it accounted for 50.2 percent. (Official statistics portal, 2023).

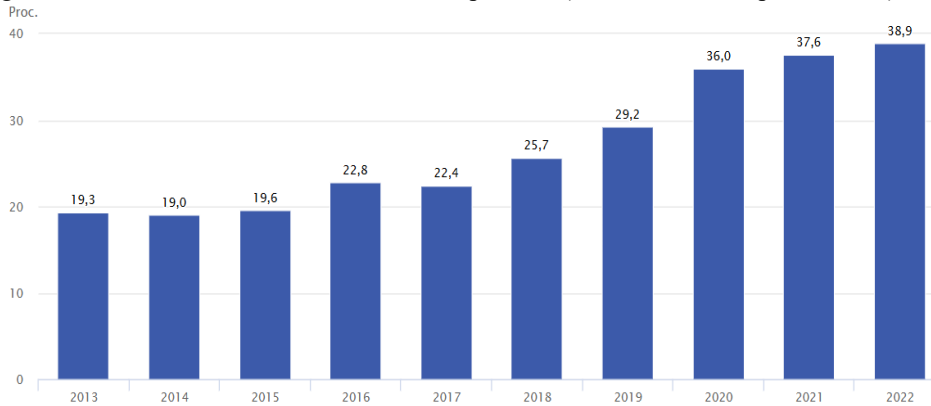


Figure 1. Companies that sold goods or services (received orders) over computer networks, part of all orders.

Source: Official statistics portal

The impact of all these factors is reflected in logistics activities, especially the last mile, i.e. i.e. the last section of the parcel delivery service from the last logistics infrastructure to the recipient's destination, demand. It is also possible to formulate a definition that last mile logistics, i.e. i.e. the last step in the supply chain where goods are delivered from a warehouse or distribution center to a retail store or directly to the end consumer.

The last mile part of the supply chain is considered highly inefficient and expensive, accounting for 13-75% of all supply chain costs. According to Bosona (2020), last mile logistics is the least efficient and complex part of the supply chain. And as expected, last mile operations also have social and environmental externalities such as air pollution, traffic accidents, congestion and stress, mobility barriers (possibility of not owning a car or not being able to drive).

Over the past two decades, the development of Internet infrastructure and the growth of e-commerce have significantly contributed to the increase in urban freight traffic, both in terms of freight volume and freight traffic (Bosona, 2020). in Lithuania in 2022 domestic cargo transportation by road transport amounted to 36.8 million tons of cargo and, compared to 2021, decreased by 19.5 percent (Official statistics portal, 2022).

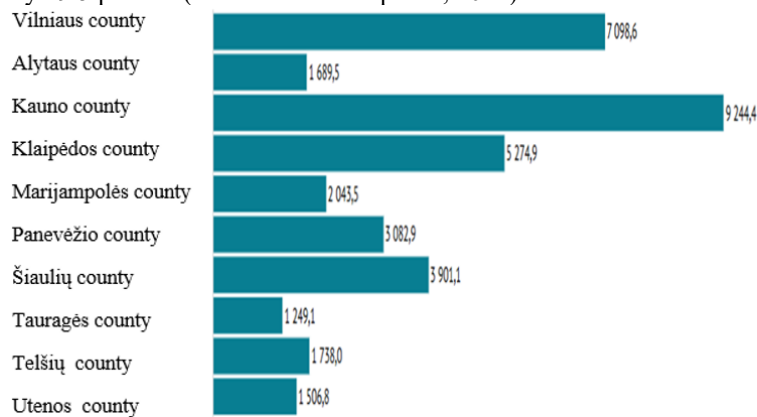


Figure 2. Domestic freight transportation by road in 2022, thousand tons.

Source: Official statistics portal.

According to the data presented in the graph, the increase in last-mile logistics freight traffic is more noticeable in metropolitan areas, where the pressure is high and will continue to increase due to the increasing population and the resulting urbanization. Until 2030 about 60 percent of the world's population will live in cities. Today, the most popular Lithuanian parcel companies process from 65 mil. pieces of shipments.

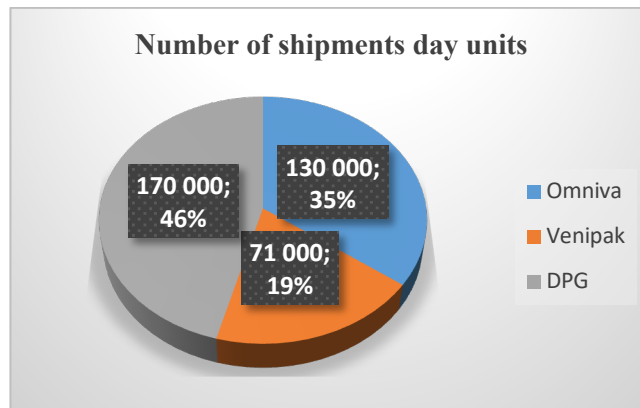


Figure 3. The number of processed shipments per day, thousand units.

Source: Compiled by the author of the paper

The last mile was and remains the most expensive and difficult to control part of the supply chain. This is partly because the last mile relies more on the human factor: the responsibility, courtesy and punctuality of the delivery driver or courier. However, beyond the human factor, there are other difficulties that companies face in implementing the principles of green logistics.

Green logistics is usually aimed at innovative solutions that include material processing, energy saving, air pollution control, environmental protection, renewable energy sources (Maymakova, 2023). The use of resource-saving technologies makes it possible to reduce material stocks by 40-60 percent, accelerate the turnover of working capital by 20-40 percent, and reduce loading and unloading and storage operations by 15 to 30 percent. On the other hand, the implementation of green logistics principles causes companies to also challenges are high costs of implementing innovative technologies and well-established traditions in waste sorting and reuse of materials. There is also a need to find effective, economically viable solutions to reduce the dependence of the parcel delivery sector on fossil fuels. Authorities currently regulate emission limits. However, a cross-sector agreement is needed to implement measures to build new facilities that meet the wishes of the entities involved in logistics activities. So, whether logistics operations are carried out in-house or outsourced, low rates and margins do not always allow thinking about investments in infrastructure, process automation or more efficient loading equipment.

In general, logistics is not sustainable because there is no customer. There is another problem: logistics is invisible to the customer and increasingly so. It is difficult to apply the principles of green logistics when the customer requires 24-hour delivery, which does not allow efficient consolidation of cargo or maximum utilization of traffic flows. In addition, logistics costs are often not included in the invoice or are negligible. This reduces their relevance and is one of the reasons why businesses do not invest in the sustainability of their environment.

Currently, service quality is the main concern of parcel delivery companies, surpassing issues such as profitability or lack of human resources. Customer satisfaction is defined as an individual's emotion or response, pleasant or unpleasant, resulting from comparing perceptions with expectations. More specifically, customer satisfaction is related to the quality of the service offered (Elnasras, Sobaihas and Saifas, 2023). Organizations have recognized that providing high-quality service to their customers creates a long-term competitive advantage. Service quality and customer satisfaction are critical aspects of corporate success, which ultimately affect market competitiveness, development, and growth (Tang et al., 2022).

The most important criterion when it comes to the quality of parcel delivery is delivery on time and fast. Companies promise fast delivery to meet the ever-increasing expectations of customers, but this is a difficult task for carriers. According to the classification of the dimensions of the SERVQUAL model, these criteria can be assigned to reliability and responsiveness. Responsiveness refers to the institution's ability to provide fast and quality services within the expected period. This requires reducing the waiting time for all interactions between the customer and the service provider (Zygiaris, Hameeds et al., 2021). Service speed is the target service time that can be performed within a specified time interval to satisfy customers (Akbar and Wadud, 2024). Reliability was assigned to the highest dimension of the SERVQUAL model. Reliability refers to the consistency and reliability of a product or service in delivering what is promised. Exact satisfaction of users' expectations creates the reliability of the service, which ensures a good name and competitiveness for the company. Customer satisfaction is greatly influenced by reliability as an aspect of service quality.

In order to reduce the environmental damage caused by last-mile logistics and meet these consumer needs, companies are forced to implement new technologies, automate operations, optimize routes and speed up the delivery of parcels to the consumer. Automating operations helps avoid problems with package damage or loss, and today's package delivery consumers expect accurate information about vehicle status, progress, delays, and sometimes even real-time tracking of the vehicle over the last mile. The implementation of secure monitoring systems increases the confidence of users and brings companies closer to the development of sustainable activities.

It is very important that customers are informed about the company's efforts to carry out sustainable activities and contribute to the implementation of the principles of green logistics.

QUANTITATIVE RESEARCH RESULTS

The first group of questions was aimed at finding out the social situation of the respondents and which segment of consumers mostly uses the services of the parcel transportation sector.

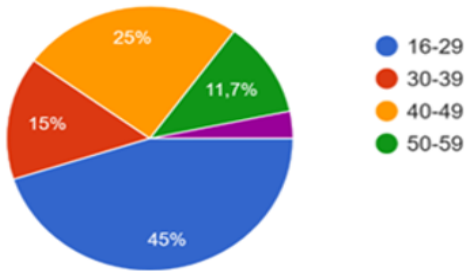


Figure 4. Age of respondents

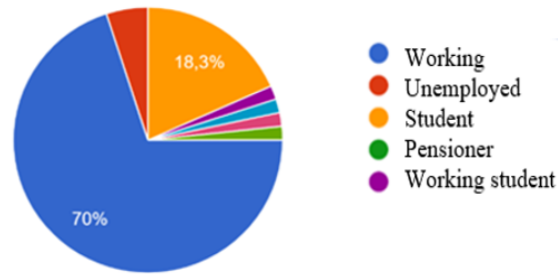


Figure 5. Social status of the respondents

In terms of the obtained results, it can be stated that the largest share of the services of the parcel transportation sector are used by working users, 70% of them indicated this. of those interviewed. The presented graph shows that 45 percent respondents are in the 16-29 age group and 25 percent fall in the 40-49 age group. We can say that the group of users of parcel transportation companies consists of young adults and middle-aged users with high employment.

Regarding the assessment of the benefits of applying the principles of green logistics, it is important to analyze the informativeness of the respondents on this topic, therefore, they were asked to answer whether the respondents have heard about the application of the principles of green logistics in the parcel delivery sector.

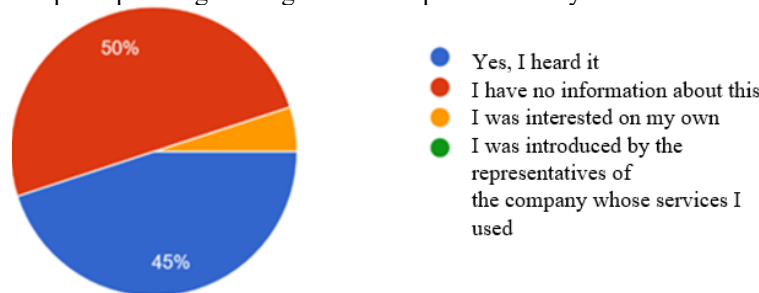


Figure 6. Informativeness of respondents about the application of green logistics principles

During the research, the following tendencies of respondents' opinions emerged: 50 percent. of the respondents stated that they do not have information about green logistics and applied principles, 45 percent. only 5% of the respondents said that they heard about it, were interested independently. respondents and none of the respondents were informed by company representatives about the benefits of applying the principles of green logistics.

In the literature analysis, it is described that the costs of the application of the principles and the deterioration of service quality fall on the shoulders of the company, but it is also seen that the companies do not inform the users about their set goals, the difficulties that have arisen, or the benefits of applying the principles of green logistics in the long term.

The second group of questions was aimed at finding out the benefits of green logistics provided by the respondents to the company and the benefits of the applied advanced technologies to the end user.

During the research, the respondents expressed their opinion about the benefits of green logistics principles for companies and 58.3 percent. respondents agree with the reduction of total costs and 41.7 percent. have no opinion or strongly disagree with this statement. 70 percent stated that it contributes to reducing fuel and energy costs, but 30% respondents answered that they had no opinion or completely disagreed with it. Contributing to the reduction of pollution, CO2 marked 73.4 percent. respondents and 56.6 percent. indicated that the application of green logistics principles increases the level of customer loyalty, but 35% respondents still have no opinion.

Also, the respondents were asked to express their opinion about the benefits of the applied advanced technologies for the end user. The conducted research made it possible to determine that 80% respondents agree that smart technologies such as tracking a shipment are useful for the consumer. 75 percent of respondents noted that transaction automation increases value for the end user. 68.4 percent approve the route optimization system. respondents and 61.6 percent confirms the use of non-polluting vehicles and the benefits they generate. We can say that the users of the parcel delivery sector support the implementation of technologies in companies and the benefits they generate.

As it was mentioned above in the article, the implementation of advanced technologies requires large investments and in the short term the quality of services may be disrupted, so the respondents were asked to provide their views on service quality disruptions in the implementation of green logistics principles.

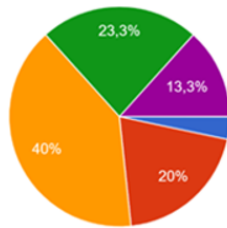


Figure 7. Extended shipment delivery time

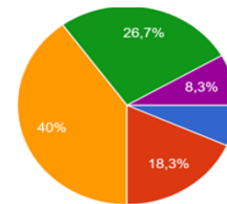
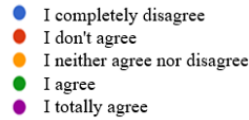


Figure 8. The place of delivery is changing

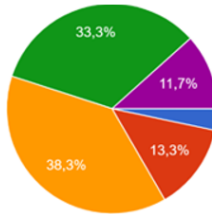
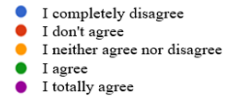


Figure 9. Delivery time is subject to change

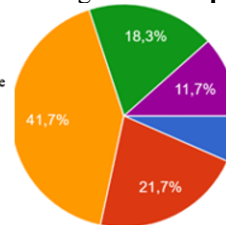
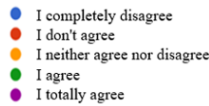


Figure 10. The price of the service has increased

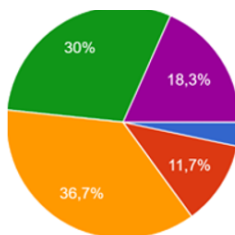
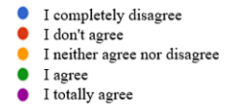


Figure 11. Pick-up and delivery of parcels is carried out only at postal machines

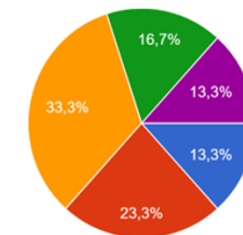
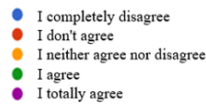
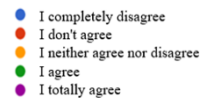


Figure 12. Cancellation of the free return service



In terms of the obtained results, it can be stated that 36.6 percent respondents would agree with the extended delivery time of the parcel. 35% would tolerate changing the place of delivery of the package. respondents and 45 percent respondents would agree to change the delivery time. Only 30 percent respondents agree with the increased price of the service. Also, picking up and delivering parcels is done only at post machines, 48.3 percent agree with that. respondents and 30 percent respondents would agree with the cancellation of the free return service. Thus, it can be seen that consumers do not have a positive attitude towards disruptions in the quality of services, even for a short period of time.

It is said that customers can get answers to their questions without human assistance and this is beneficial on the one hand because it saves customers time and on the other hand it allows customers to have a positive and hassle-free experience with the company or brand. In addition, chatbots are increasingly being used to replace customer service personnel, as they can provide constant, always positive interactions and 24/7 support. The relatively low cost of deploying and using chatbots makes them attractive to many businesses. Therefore, respondents were asked for their views on the application of AI for more effective customer service in the parcel delivery sector:

- * "Customer service must be performed by a person so that processes run smoothly and efficiently;
- * "Will not ensure. Customers prefer real, live interaction to interaction with AI";
- * "Artificial intelligence improves customer service, speeds up responses, enables 24/7 availability and personalizes services";
- * "I think it will definitely not be ensured. Solving problems requires human input";
- * "Currently, artificial intelligence is not developed enough to be convenient and easy to understand for the user. It just annoys users."

When we talk about ecology and the application of the principles of green logistics, it is important to understand that the planet earth is the home of people, so it is important to learn to protect it from pollution and irreversible consequences. In order to achieve these goals, the respondents were asked to give their opinion on whether they would agree to use an information program, with the help of which the resident would have the opportunity to deliver a small parcel to the post machine while on the way, thus contributing to the reduction of traffic flow, pollution, noise and nature preservation for future generations.

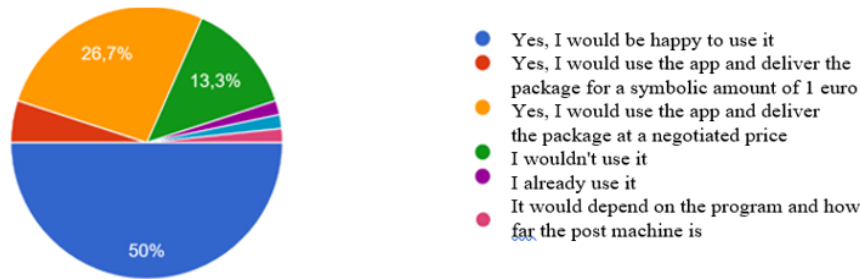


Figure 13. **The use of the small package delivery program, which provides an opportunity for residents to pick up small packages while on the way**

The conducted research made it possible to determine that 50% respondents would be happy to use such a program. 26.7 percent indicated, "yes, I would use and deliver the shipment at the agreed price"; 13.3 percent said they would not use it. and 10 percent of the respondents indicated that it depends on the convenience of the program and how efficiently the post machines are arranged.

After summarizing the research results, it is possible to formulate the conclusion that the respondents are not satisfied with the integration of artificial intelligence in the customer service process and the added value it creates. Also, consumers are not positive about service quality disruptions and increased prices. Thus, it would be worth paying more attention to improving the development of the transport system and involving the public in the process of implementing and disseminating the principles of green logistics, in order to achieve the common goal of preserving nature.

CONCLUSIONS

1. The principles of green logistics are based on the triple principle, according to which the environmental, social and economic impact of logistics activities is taken into account, so the benefits accrue to the company, its suppliers and partners, customers and every member of society. Green logistics strategies improve operational efficiency, profitability, increase the company's competitiveness, reliability, help meet the growing needs of customers and reduce the carbon footprint.

2. In this period, logistics is increasingly invisible to the customer, which makes it difficult for companies to apply the principles of green logistics. According to the results of the conducted research, consumers do not look favorably on service quality disturbances due to the application of the principles. Only 36.6 percent agree to wait longer for the shipment. respondents, as well as only 30 percent. would agree to pay a higher price for the delivery of the package. It was also determined that consumers would not agree to refuse the free return service, even 69.9 percent indicated this. respondents. However, consumers would be happy to contribute to sustainable activities in other ways, such as carrying a small package while en route. It can be said that this system would be very useful in Lithuanian villages and small towns, where parcel delivery is not efficient. Also, the majority of respondents would refuse the service of home delivery of small parcels, which would help reduce vehicle traffic, pollution, and noise, especially in the big cities of Lithuania.

REFERENCES

- Akbar A. ir Wadud M. (2024). The Effect Of Speed And Reliability Of Service On Customer Satisfaction Mediated By Employee Performance In Using Agency Services At PT Bukit Prima Bahari. file:///C:/Users/Hp/Downloads/4974-Article%20Text-26014-2-10-20240504.pdf
- Bosona T. (2020). Urban Freight Last Mile Logistics—Challenges and Opportunities to Improve Sustainability: A Literature Review. <https://www.mdpi.com/2071-1050/12/21/8769>
- Elnasras A., Sobaihas E. ir Saifas A. (2023). Effects of Parcel Delivery Service on Customer Satisfaction in the Saudi Arabian Logistics Industry: Does the National Culture Make a Difference? <https://www.mdpi.com/2305-6290/7/4/94>
- Isaksson K. ir Huge-Brodin M. (2013). Understanding efficiencies behind logistics service providers' green offerings. <https://www.emerald.com/insight/content/doi/10.1108/01409171311306382/full/html>
- Tang R., Tan Y., Tan Z., Almadwad M., Alosaimi A. (2022). A Study of Courier Service Quality and Customer Satisfaction. https://www.researchgate.net/publication/366151804_A_Study_of_Courier_Service_Quality_and_Customer_Satisfaction
- Maymakova L., (2023). Environmental problems and ways to solve them in the development of transport and logistics services. <http://rppe.ru/new/index.php/rppe/article/view/2122>
- Wehner J., Taghavi N., Deilami N., Altuntas C., Halldórsson A. (2021). Logistics service providers' energy efficiency initiatives for environmental sustainability. <https://www.emerald.com/insight/content/doi/10.1108/IJLM-10-2019-0270/full/html>

- Oficialios statistikos portalas (2023). <https://osp.stat.gov.lt/skaitmenine-ekonomika-ir-visuomene-lietuvoje-2023/e-komercija/e-prekyba-imonese>
- Oficialios statistikos portalas (2023). <https://osp.stat.gov.lt/lietuvos-regionai-2023/aplinka/transportas#kroviniai>
- Silva V., Amaral A., ir Fontes T. (2023). Sustainable Urban Last-Mile Logistics: A Systematic Literature Review. <https://www.mdpi.com/2071-1050/15/3/2285>
- Zygiaris S., Hameedas Z., Alsubaie M., Rehman S. (2021). Service Quality and Customer Satisfaction in the Post Pandemic World: A Study of Saudi Auto Care Industry. <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2022.842141/full>