MANAGING CUSTOMER SATISFACTION WITH METROPOLITAN PUBLIC TRANSPORT SERVICES BASED ON PERCEIVED QUALITY ASSESSMENTS

Galina Timokhina
Plekhanov Russian University of Economics, Moscow, Russia

Sergey Mkhitaryan
Plekhanov Russian University of Economics, Moscow, Russia

Irina Skorobogatykh
Plekhanov Russian University of Economics, Moscow, Russia

Natalia Ivashkova
Plekhanov Russian University of Economics, Moscow, Russia

Irina Shirochenskaya
Plekhanov Russian University of Economics, Moscow, Russia

ABSTRACT

The purpose of this research is to study consumer satisfaction with the perceived quality of ground public transport (GPT) services in the Moscow metropolitan area. The methodology used includes identification of the quality attributes of GPT services relevant to consumers which affect consumer satisfaction, the choice of alternative transport modes, and the competitiveness of GPT services. Study reliability is ensured by a representative sample which included the results of an online survey of 1517 respondents, cluster analysis and the employment of the CHAID decision tree method. The authors formulated and confirmed 4 hypotheses. Thirty-two attributes influencing consumer satisfaction with GPT services were obtained; clusters with different degrees of satisfaction were identified; and attributes of perceived quality which are important for consumers when choosing transportation modes were revealed. Recommendations for marketing and management solutions to improve the competitiveness of urban GPT services in relation to substitutes in order to increase the mobility of the population and reduce the environmental pollution of the metropolis were proposed.

Keywords: Ground Public Transport (GPT), passenger's satisfaction, attributes of service quality, metropolis, marketing solutions

DOI: http://dx.doi.org/10.15549/jeecar.v9i3.789

INTRODUCTION

Under conditions of extremely unstable socio-ecological systems in megacities, the task of public transport development and increasing consumer satisfaction with urban public transport services becomes very urgent for economic entities in the field of public transport (Singh, 2013).

At present, public transport in Moscow carries out about 80% of passenger traffic, and it is planned to increase this share by 10% by 2030. This will halve the share of private vehicles, unload the street network, and reduce vehicle emissions (Lopatinskaya et.al., 2021). Switching 90% of the city population to public transport in urban passenger transportation can be achieved not only by restrictive measures regarding the use of private vehicles, but also by improving the performance of public transport and increasing passenger satisfaction (Skorobogatykh at al. 2019).

A passenger's choice of a way to move around the city between a private car and public transport depends on his satisfaction with important attributes of the quality of public transport services, for example, such as speed, regularity (reliability) of communication, comfort, and cost. Changing the indicators of the quality of public transport services and increasing consumer satisfaction with the attributes of the quality of service makes it possible to redistribute the passenger flow in favor of public transport.

Increasing consumer satisfaction with public transport services compared to alternative modes of transportation in the metropolis is possible only at the expense of maximum satisfaction of consumers' generic and derivative needs in mobility (Li et.al., 2018).

In world - and Russian - practice, there is considerable experience in measuring consumer satisfaction with the quality of public transport services. However, there are no universal methodologies for studying and measuring consumer satisfaction with the attributes of the quality of public transport services.

In this connection, researchers have to carry out a scientific search for such a methodology of studying consumer satisfaction with the quality of GPT services that would be adequate to the tasks of researching the problems of increasing consumer satisfaction with public transport in specific territories.

Managing consumer satisfaction with urban public transport services is a complex and non-trivial task, as is explained by the fact that consumer satisfaction with a service is determined by the set of only those specific attributes that are of clear interest to a given consumer and ensure the satisfaction of this particular need (Popov et.al., 2016).

From the authors' point of view, the fulfillment of this complex task is provided by applying the marketing concept, which will allow forming a positive image in the minds of actual and potential consumers of the enterprises providing urban public transport services.

The purposes of this research are to study consumer satisfaction with the perceived quality of GPT services in the Moscow metropolitan area on the basis of the authors' methodology; identify the attributes of GPT service quality that are relevant to consumers and affect consumer satisfaction as well as the choice of alternative modes of transport, and the competitiveness of GPT services. As a result, the authors have formulated the following research questions:

1. Which attributes of public transport services quality mostly influence the dynamics of the level of consumer satisfaction?
2. What additional factors influence consumer overall satisfaction with the GPT which are differentiated by the degree of satisfaction with the most critical and relevant attributes of service quality?

LITERATURE REVIEW

Customer satisfaction with the perceived quality of goods, services/enterprises

Researchers describe consumer satisfaction with goods (services)/enterprise both in a general sense and in relation to the public transport system (Lukina et.al., 2018; d'Ovidioa, 2014). A number of theories of satisfaction are based on the assertion paradigm, according to which the consumer either confirms or denies the compliance of the goods (services)/enterprise in question with the reference requirements that were pre-formulated or modified during the consumption of goods (services) (Salimova et.al., 2007; Ibrahim et.al., 2019). The psychological state of the consumer, which reflects such compliance, is called satisfaction with the purchase of a good/service (Miller, 1977; Oña et.al., 2015).

Some authors consider satisfaction with urban public transport services as an emotional response to the perceived quality of service attributes, based on a rational assessment of the attributes and prior consumer experience (Rakhmatullina, 2015; Mkhitaryan, 2020). Summarizing different approaches to defining the "satisfaction" concept in relation to public transport networks, Nosov singled out three main components: consumer

emotional reaction, rational assessment of the quality attributes of transport services based on experience and comparison, and finally, consolidation of the assessment obtained in the consumer experience (Nosov, 2014). Gavrikov and Penshin defined satisfaction as the degree to which the provision of services meets customer needs and values (Gavrikov et.al., 2015).

Del Castillo, Benitez, Tyrinopoulos, Antoniou and others, when studying satisfaction, operated with the concept of "satisfaction level", which they defined as an aggregate measure of perceived satisfaction with the attributes of the transport system [Castillo et.al., 2012; Tyrinopoulos et.al., 2008).

International and Russian scientific literature describes a significant number of methods, techniques, models assessing customer satisfaction with the quality of goods and services (Zavyalov et.al., 2015; Lambin, 1996; Tlegenov, 2017; Faskhiev, 2017; Stutsman, 2002; Yaya, 2014). To assess consumer satisfaction with the quality of services, in practice, consumer satisfaction indices are widely used (Barabino et.al., 2012; Castillo, et.al., 2012).

Along with the indices of satisfaction in the scientific literature, methods, models and methodologies are described that were systematized by the authors as the most relevant for studying consumer satisfaction with public transport services (d'Ovidioa, 2014; Shinkarenko et.al, 2014). The analysis of the research carried out by the authors showed a wide variety of methods from Lambin's multi-attributive model of relationships (Lambin, 1996), to Kano's model (Jaime, 2018), to a customer satisfaction management model based on the profile method (Faskhiev, 2017), to "touch (contact) points" models (Sidorchuk and Efimova, 2015), and finally to a comprehensive assessment methodology of satisfaction which considers both objective and subjective attributes of the public transport system (Lopatinskaya et.al., 2021, Eboli et.al., 2011; Tyrinopoulos & Aifadopoulou, 2008).

Quality attributes of public transport services that affect customer satisfaction

We have analyzed research data from 2007 to 2020, one of the purposes of which was to identify the most important attributes of perceived service quality for consumers. It should be noted that there is a widespread in consumers' opinions regarding the key and most important quality attributes of public urban transport services. Whereas in experiments conducted by A. Parasuraman, A. Zeithaml and L. Berry in 1988 using the SERVQUAL method (Parasuraman et.al., 1988), reliability was the most important service quality attribute in any market. Later, in studies of the public transport services quality for the period of 2007-2020, such service attributes as traffic frequency, safety and comfort turned out to be as significant for the consumers as reliability (Eboli et.al., 2007; Habib et.al., 2011; Iseki et.al, 2010; Felleson et.al., 2012; Oña et.al., 2013; Bordagaray et.al., 2014; Tarigan et.al., 2014).

A significant contribution to research on the efficiency and quality of public transport was made by scientists from countries with emerging economies, in particular from Indonesia, India and Russia (Tarigan et.al., 2014; Zavyalov et.al., 2015; Popov et.al., 2016; Gavrikov and Penshin, 2016; Faskhiev, 2017; Seifullaeva et.al., 2018; Sidorchuk and Efimova, 2015; Morozova, 2018; and Lopatinskaya et al. 2020).

Research by Russian scientists was carried out in such large cities as Moscow, Sochi, Novosibirsk, and Tomsk on different categories of public transport consumers, ground and underground transport in particular, using various methods of mathematical statistics as factor analysis (Popov et.al., 2016; Tsoy et. al., 2017; Lopatinskaya et al. 2020), regression models (Gavrikov and Penshin, 2016) and structural equation modeling (Sidorchuk and Efimova, 2015). In addition to the above, the most important attributes of perceived service quality revealed in these research studies were: congestion, cleanliness, cell phone service, no crowds, navigation signs, cost-effectiveness, accessibility, the choice of alternative modes of transport, and others.

Some Russian researchers have noted that the consumer appraisal process usually qualifies as a confirmation/non-confirmation of expectations paradigm. It is assumed that consumer satisfaction with the service quality is achieved when the level of expected and perceived quality corresponds (Seifullaeva et.al., 2018; Aveznova et.al., 2017). Other Russian and foreign researchers have tended to consider the perceived service quality, including public transport services, rather than the expected quality, since this marketing construct correlates well with customer satisfaction and value (Morozova, 2018; Geetika, 2010; Kral et.al., 2018;

Pojani et.al., 2015; Rayushkina et.al., 2013; Oña et.al., 2015).

Analysis of the existing literature gives us a variety of methods and models for assessing customer satisfaction of the perceived quality of services. It helps to develop the author's research methodology relevant to the assigned research tasks. At the same time, we have considered the importance of studying the competitive positions of the analyzed objects and the behavior of consumers of GPT services in Moscow.

METHODOLOGY

The authors' research methodology was developed to study the consumer assessments of GPT service quality based on the integration of two methods of assessing the quality attributes of GPT services that affect the level of customer satisfaction.

Moscow public transport services are provided to residents of the metropolitan area by ground and underground public passenger transport; it is the largest transport hub in Russia. With the help of Moscow public transport, more than 16.5 million trips are made per day, which shows a high degree of load on this system[1]. The GPT system is represented by urban and suburban automobile and electric transport, the corresponding transport infrastructure. Motor transport includes buses and minibuses, electric transport - both rail transport: trams, city trains (including high-speed aero express trains), monorail, and non-rail in the form of electric buses and cable cars. The organization of rental bicycles and scooters contributes to passengers' commuting from the metro stations to their final destination and vice versa. The most important component of the transport infrastructure consists of routes urban transport routes covering different areas of Moscow, and the regulation of traffic flow using the Moscow Central Ring [2], radial and peripheral lines of urban transport, including the Moscow Central Diameters[3].

We focus in this study on studying consumer assessments of satisfaction with GPT (specifically the buses and electro buses) using the following methods:

1. A methodology for classifying respondents according to their satisfaction with the perceived quality of metropolitan GPT services. This research and analysis methodology allows for classifying respondents into groups (clusters) using a deductive method by the degree of overall consumer satisfaction with GPT services in general, satisfaction with GPT route network by 16 quality attributes, and satisfaction with equipment and condition of buses and bus stops by 16 quality attributes (see Table 1). This methodology identifies the most problematic attributes affecting the satisfaction with the GPT route network, the condition and equipment of buses and bus stops in metropolitan Moscow for selected groups of clusters with different degrees of satisfaction (dissatisfaction). Methods of analysis used included method of multidimensional classification - hierarchical cluster Ward's analysis; correspondence tables, and chi-square criterion to assess the significance of the relationship.

The degree of satisfaction was assessed on a 5-point scale with 1 - not satisfied, 2 - rather dissatisfied, 3 - partly satisfied, partly not, 4 - rather satisfied, 5 - completely satisfied.

The study was conducted in the 4th quarter of 2020 by the researchers of members of the Department of Marketing (Academic chair) of Plekhanov Russian University of Economics.

The methodological basis for the field phase of the study of consumer satisfaction with the quality of GPT services was sample surveys of the population of Moscow-city. The online questionnaire was conducted on a sample of 1,517 valid units. The sample size was calculated using the non-repeat selection formula considering the

[1] Moscow Public transport dynamics: https://www.mos.ru/mayor/themes/2299/7178050/

[2] Moscow Central Ring is an important part of the Urban Ground public transport component of 31 stations, that encircles historical part of Moscow. The line is rebuilt from the Little Ring of the Moscow Railway and opened to passengers on 10 September 2016. https://www.mos.ru/en/news/item/95857073/

[3] The Moscow Central Diameters (MCD) are the system of city train services on existing commuter rail lines in Moscow and Moscow region (Moscow metropolis area). The system began operation on 21 November 2019, when the first two lines were launched. On 27 December 2019, passengers made record 554.6 thousand trips. https://www.mos.ru/en/city/projects/diametries/

adult population of Moscow, or 10.35 million people. (According to Federal State Statistics Service(RosStat) data) and a marginal error of the mean 0.05 points (which, with a 5-point assessment of satisfaction, is 1%).

Table 1: Quality attributes of GPT services that determine customer satisfaction

Attributes of service quality that affect satisfaction with the GPT route network	Attributes of service quality that affect satisfaction with the equipment and condition of buses and bus stops
1. Ticket price	1. Ticket validation/payment system inside the bus
2. Proximity of bus stops	2. Air conditioner operation
3. Frequency of bus travel	3. Navigation inside the bus
4. Waiting time at a stop	4. Entry/exit equipment
5. Punctuality (keeping a schedule)	5. Luggage space
6. Bus schedule	6. Equipment for passage of people with low mobility
7. Convenience of getting on/off the bus	7. Cleanliness of the vehicle
8. Bus congestion	8. Scoreboard with the actual time of arrival of the bus
9. Feeling safe at the bus stop	9. Weather protection (wind, precipitation)
10. Feeling of safety on the bus	10. Seating places at the bus stop
11. Equipment and condition of the bus	11. Navigation (map with the position of the bus stop and the nearest important points)
12. Convenience, equipment, appearance of the bus stop	12. Ticket service
13. Driver behavior	13. Internet service
14. Behavior of controllers	14. Sockets for charging your phone
15. Convenience of buying a ticket/paying the fare	15. Lighting at the bus stop
16. Accessibility of transfer to other modes of transport	16. Cleanliness at the bus stop

Source: author's work.

To ensure representativeness, gender and age of the sample corresponded to the proportions of Moscow dwellers in accordance with the data of Federal State Statistics Service (RosStat) for the adult population (over 18 years old to the age of retirement - 60+ for women and 65+ for the man[4]). The wide distribution and accessibility of the Internet in Moscow makes it possible to reach a sufficient number of Moscow dwellers using online questionnaires to ensure representativeness, based on quotas of age distribution. The internet penetration rate in Moscow is 87.5, compared to 85% for Russia as a whole[5].

2. Methodology of studying the impact of consumer assessments of satisfaction with the attributes of GPT services on overall satisfaction. According to this methodology: consumer groups with different degrees of satisfaction with the route network of GPT are identified; the most relevant and problematic attributes of quality of GPT services, affecting consumer satisfaction and choice of alternative modes of transport are determined; and consumer groups for which

[4] Researchers excluded the Youth population (under 18) and retired (senior) population (60+ for women and 65+ for man) from the sample. According to the decisions of Moscow government the retired population use the all Public transport services free of charge, and the Youth are using public transport services with the discount, but even the payments for them are sponsored by parents. Based on this assumption we decided not to invite them into the survey, because level of satisfaction for them in high enough, and this is confirmed in our previous studies.

[5] Leaders of Internet penetration rate in Russia: https://www.tadviser.ru/index.php

various attributes of perceived quality of transport services, in addition to the key, most critical attribute, significantly affect consumer satisfaction scores are identified. The methods of analysis used was the method of constructing a classification tree – CHAID - based on the evaluation of the relationship of parameters using the chi-square criterion.

The following parameters were set for the construction of the classification tree: maximum number of levels in the tree - 3; minimal number of variables in the parent node - 200; minimum number of variables in the child node – 100. These parameters were chosen in order to ensure the representativeness of the terminal nodes, and, therefore, to increase the reliability of the conclusions. A larger number of tree levels or a decrease in the minimum size of the parent node and the child node would lead to a reduction in the size of terminal nodes, which would cast doubt on the results of the analysis.

As a result, a classification tree including 18 nodes was built.

The variable "Satisfaction with the quality of services of the route network of surface urban passenger transport" was chosen as the target dependent variable, created on the basis of respondents' evaluation of the overall satisfaction with GPT.

This research assumed the following:

The profile of "satisfied" and "dissatisfied" consumer groups/clusters may show significant differences in their assessment of satisfaction with certain attributes of perceived quality of GPT services.

Some characteristics of the consumers' socio-demographic profile may have a significant impact on the respondents' satisfaction ratings allocated to different clusters in accordance with their satisfaction level with the perceived quality attributes of GPT services.

RESEARCH RESULTS AND DISCUSSION

Classification of respondents according to the degree of customer satisfaction with the perceived quality of GPT services in the Moscow metropolitan area

The cluster analysis revealed 4 clusters that differ in the degree of customer satisfaction with the perceived quality of GPT services: dissatisfied (8% of respondents), partially satisfied (30%), satisfied (45%), fully satisfied (17%) (see Figure 1).

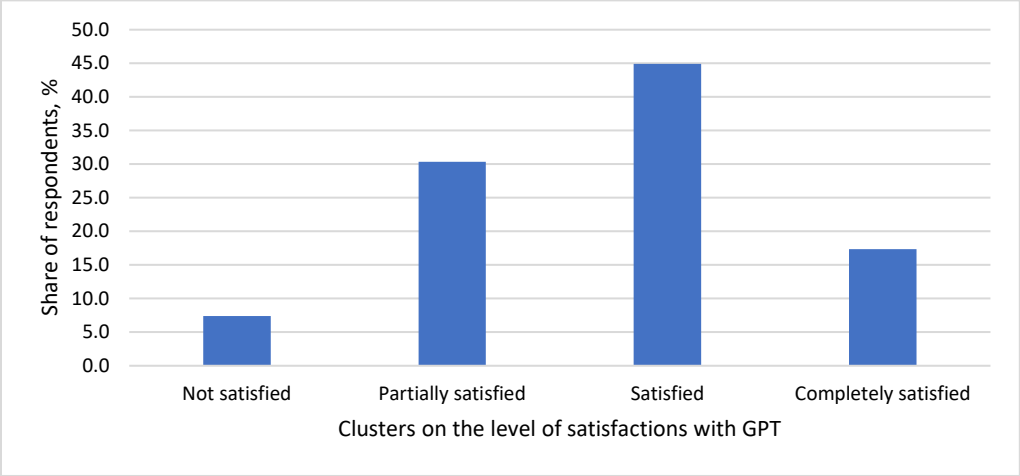

Figure 1: The clusters of respondents differing in their satisfaction with the quality of GPT services in Moscow metropolitan area

Source: author's work.

In terms of average satisfaction with the route network of GPT in general, the difference in satisfaction scores between the representatives of different clusters ranges from 0.6 to 0.7 points (see Figure 2). In terms of average satisfaction with the route network of GPT by attributes, the difference in the evaluation between the representatives of different clusters ranges from 0.4 to 0.7 points (see Figure 2).

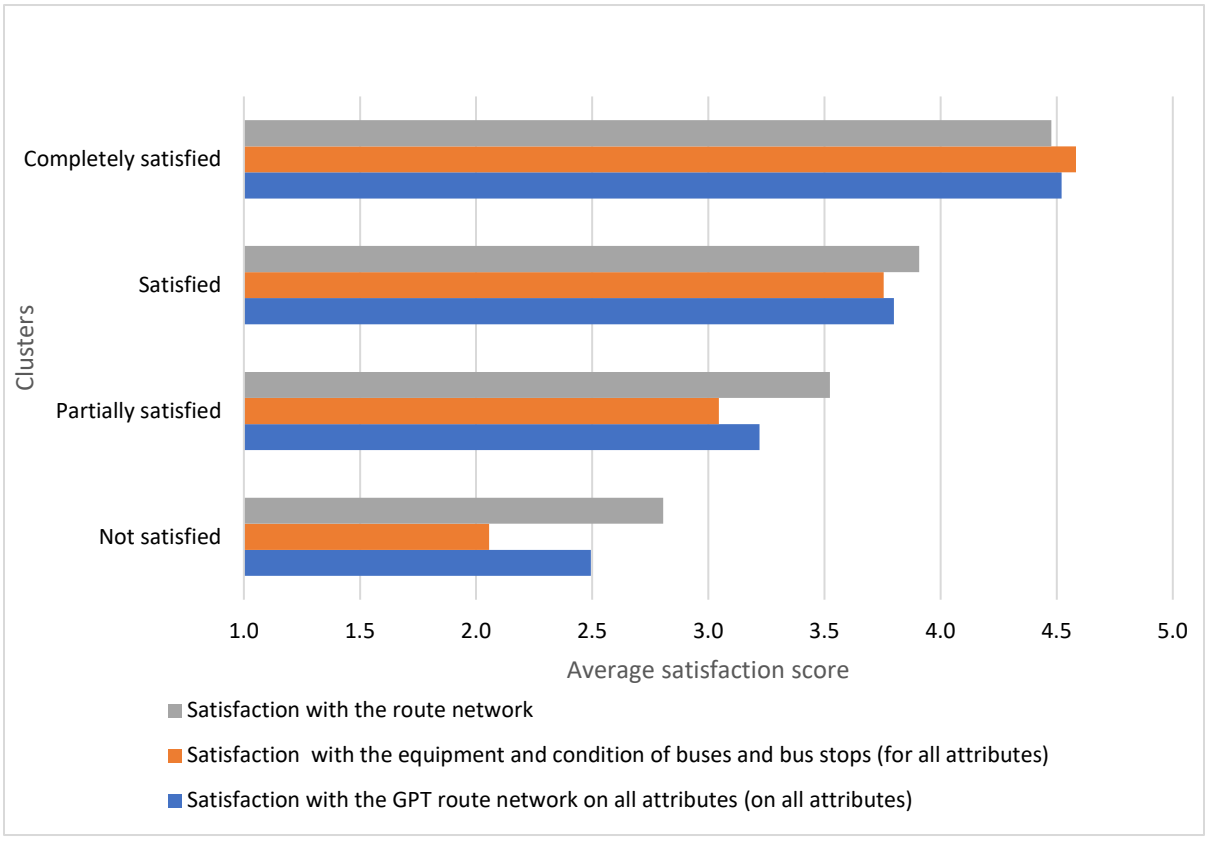

Figure 2: Satisfaction with the GPT route network in general, the GPT route network (average of all 16 attributes), the equipment and condition of buses and bus stops (average of all 16 attributes) in Moscow metropolitan area

Source: author's work.

According to the indicator of average satisfaction with the equipment and condition of buses and bus stops by attributes, the difference in the assessment between representatives of different clusters ranges from 0.8 to 0.9 points (see Figure 2).

The largest difference in satisfaction ratings between fully satisfied and dissatisfied respondents, 2.5 points, is revealed for the indicator of average satisfaction with equipment and condition of buses and bus stops by attributes. Graphs of the average values of 16 indicators of consumer satisfaction with the route network of Moscow GPT and 16 indicators of consumer satisfaction with the equipment and condition of buses and bus stops were used to build a profile of each cluster (see Figure 3. 4).

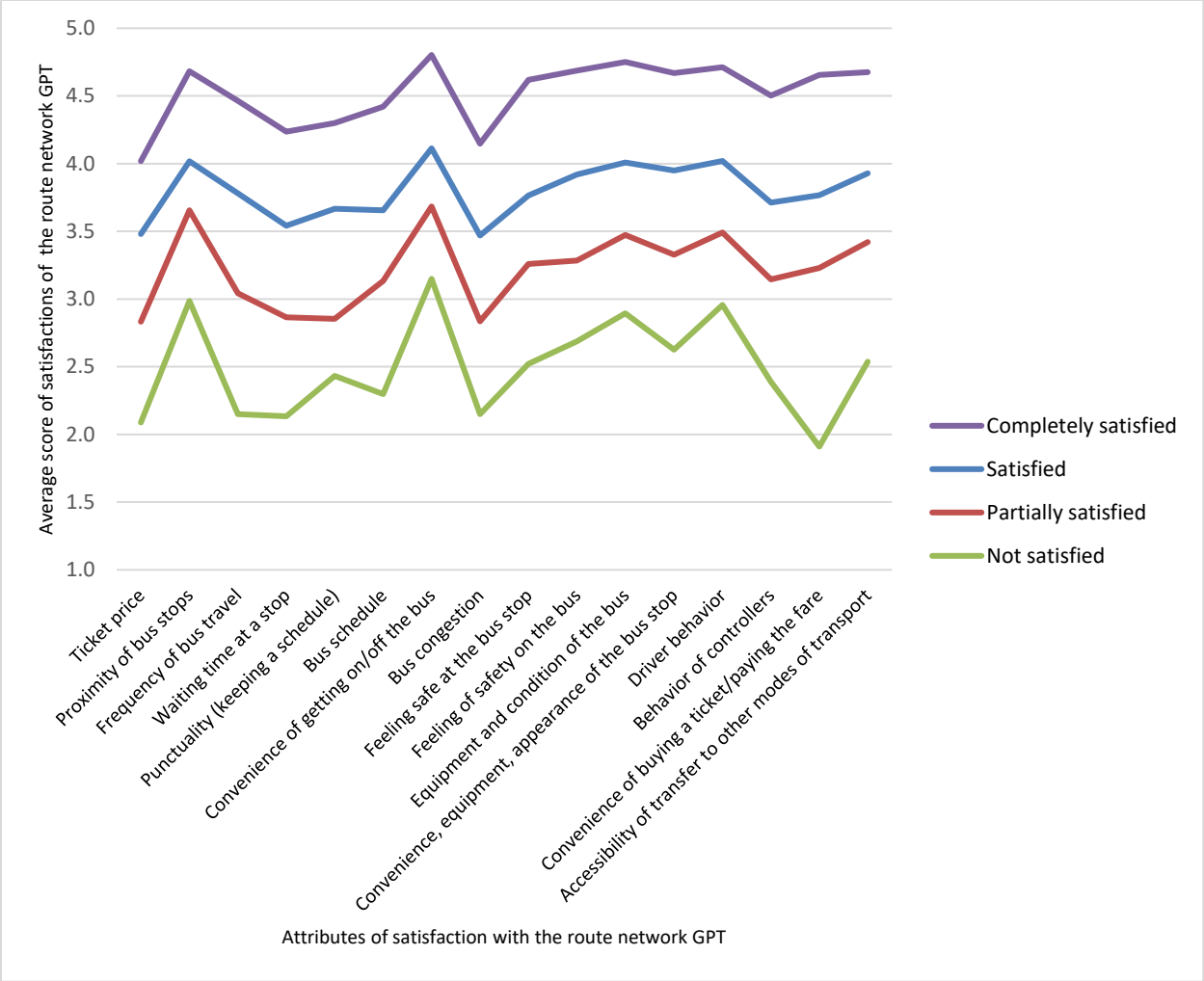

Figure 3: The average values of consumer satisfaction with the route network of GPT in Moscow metropolitan area

Source: author's work.

The profiles of all 4 clusters are characterized by relatively average values of high satisfaction scores on the indicators "Proximity of bus stops", "Ease of getting on/off the bus", "Navigation inside the bus", "Equipment for passage of people with low mobility"; there were relatively low satisfaction scores for indicators: "Ticket price", "Bus congestion" (see Figure 3. 4).

The strongest differences from the representatives of other clusters are observed in the profile of dissatisfied consumers - extremely low satisfaction scores on the indicators: "Convenience of buying a ticket/payment of fare"; "Navigation (map with the position of the stop and the nearest important points)"; "Ticket purchase point"; and "Quality of access to internet on board of a bus".

Among dissatisfied respondents, the proportions by share of transportation costs in the monthly budget are as follows: 11 - 20% of the budget (24% of respondents, vs. 16% average for the rest of the clusters); 21 - 30% of the budget (9%, vs. 5% average for the rest of the clusters), 31 - 50% of the budget (8%, vs. 2% average for the rest of the clusters), and over 50% of the budget (3%, vs. 1% average for the rest of the clusters).

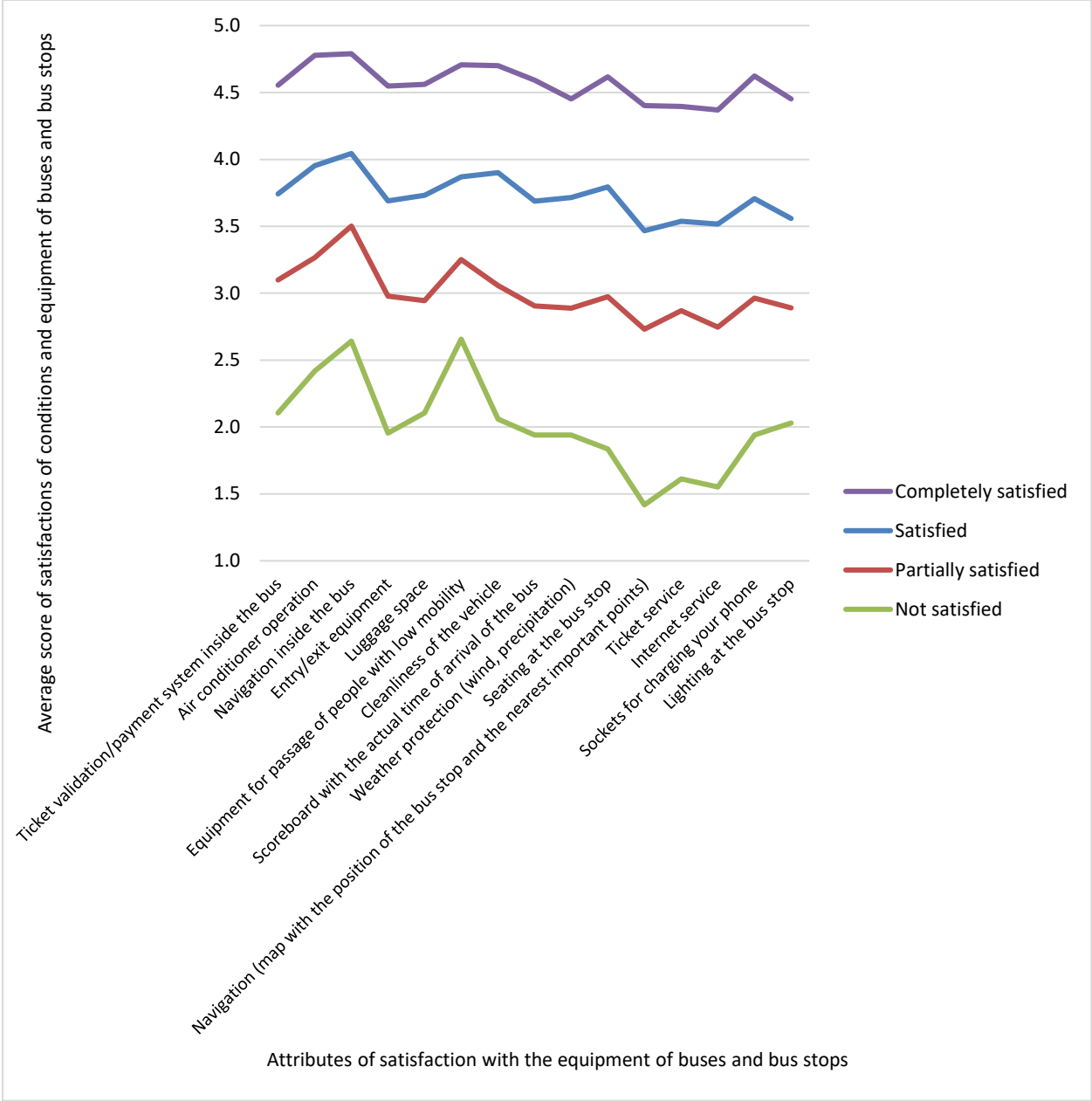

Figure 4: The average values of indicators of equipment and condition of buses and bus stops in Moscow metropolitan area

Source: author's work.

When studying the differences in consumer satisfaction scores of representatives of different clusters depending on their socio-demographic variables, statistically significant differences were revealed between the estimates of respondents from different clusters who differed according to the variable 'the share of transportation expenses in the monthly budget of the respondent' (see Figure 5).

The study deliberately did not consider the cost of public transport in monetary terms, but by the share in the respondents' income, since it is this relative indicator that makes it possible to assess how accessible public transport is for a particular resident. The management of metropolitan transport congestion is carried out with, among other things, the help of the tariff policy.

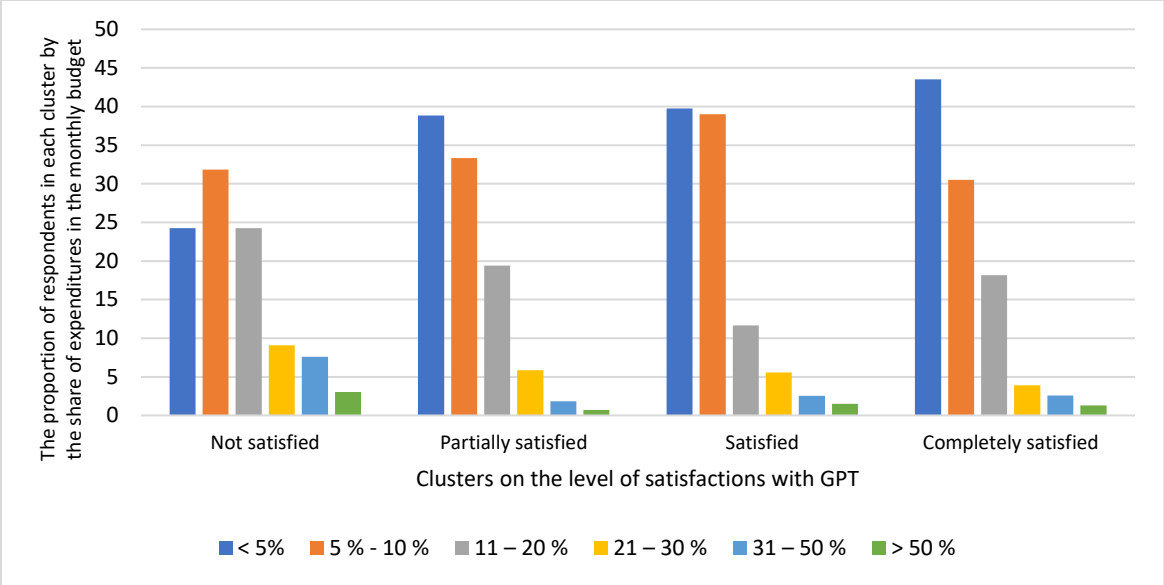

Figure 5: Distribution of respondents by cluster and the share of transportation costs in the respondent's monthly budget

Source: author's work.

Study of the influence of consumer assessments of satisfaction with the attributes of GPT services on overall satisfaction in the Moscow metropolitan area

The following categories of respondents' satisfaction with the route network on the sample were identified: not satisfied - 35% of respondents; satisfied - 48%; and fully satisfied - 17%. This classification was obtained on the basis of a 5-point satisfaction score provided in the methodology (categories 1 - not satisfied, 2 - rather dissatisfied, and 3 - partly satisfied, partly not - were combined into the category of dissatisfied respondents). Attributes of the perceived quality of surface urban transport services, which influence satisfaction/dissatisfaction, have been defined.

Based on the results obtained, it was found that the dynamics of the level of customer satisfaction is most influenced by such an attribute of the perceived quality of GPT services as the frequency of the bus.

It is worth mentioning that for representatives of different groups, according to the degree of satisfaction with the frequency of bus traffic, various indicators affect the overall satisfaction with the GPT route network.

Dissatisfied with frequency of travel: the main influence is protection from weather conditions at public bus stops; for those dissatisfied with protection (node 5, 8% of the sample) the proportion dissatisfied with the route network is 89% (2.5 average).

Partially satisfied, partially not satisfied with the frequency of traffic: the main influence has the convenience of getting on/off the bus. Among the dissatisfied and partially satisfied, partially not satisfied with the convenience of getting on/off the bus (node 7, 9% of the sample) the share of dissatisfied with the route network is 65% (1.8 average), fully satisfied - 5% (0.3 average).

It should be noted that for respondents who are rather satisfied with the convenience of entry/exit, an additional criterion influencing the satisfaction with the route network is the availability of transfers to other modes of transport.

Rather satisfied with the frequency of travel: the main influence is the convenience of getting on/off the bus. Among the dissatisfied, partially satisfied, and rather satisfied with the convenience of getting on/off the bus (node 10, 25% of the sample) the share of dissatisfied with the route network is 23% (0.7 average), fully satisfied - 8% (0.5 average).

It should be noted that for respondents who are dissatisfied, partially satisfied, and rather satisfied with the convenience of getting on/off, an additional criterion influencing the satisfaction with the route network is the availability of transfers to other modes of transport.

Completely satisfied with the frequency of traffic: the main influence is the lighting at stops - for those dissatisfied, partially and rather satisfied with the lighting - node 12, (7% of the sample) the share of dissatisfied with the route network is 20% (0.6 average), fully satisfied - 33% (2.0 average); among those fully satisfied with the lighting - node 13, (8% of the sample) the share of dissatisfied with the route network is 3% (0.1 average), fully satisfied - 70% (4.1 average). For passengers who do not have to wait long for a bus, lighting is a very important factor, possibly related to safety.

CONCLUSION AND RECOMMENDATION

The results of the study allow us to draw conclusions about the achievement of the research goal in studying consumer satisfaction ratings with the perceived quality of GPT in the Moscow metropolitan area on the basis of the authors' methodology. The goals were also achieved in the field of identifying the attributes of GPT services quality relevant to consumers, influencing consumer satisfaction, and the choice of alternative modes of transport.

The novelty of the authors' methodology is a methodical approach to the study and analysis of consumer satisfaction ratings with the quality of services of different infrastructure facilities of GPT based on the application of deductive methods from estimates of overall consumer satisfaction with the services of GPT in general, to the satisfaction with the route network of GPT by 16 attributes and satisfaction with the equipment and condition of buses and bus stops by 16 attributes The authors' methodology and the study conducted on its basis, is a contribution to the theory and methodology, complementing and enriching the existing methods of assessing customer satisfaction with the perceived quality of services.

The obtained assessments of customer satisfaction with the perceived quality of GPT services represent important input data for the development of marketing strategies in order to make management decisions to improve customer satisfaction with GPT.

The obtained data of the marketing research carried out by the authors serve as the basis for the development of strategies for segmenting consumers of GPT services. Significant differences between the indicators of average satisfaction with the perceived quality of GPT services of the clusters "satisfied" and "dissatisfied" in the framework of marketing decisions can be considered as differences between customer segments. Accordingly, the development of differentiated marketing programs will allow public transport enterprises to work differently with target segments with varying degrees of consumer satisfaction.

From the point of view of tactical marketing decisions, it will be important to change product policy within the framework of improving the quality of GPT services by attributes relevant to the "unsatisfied" segment. A qualitative change in these attributes can be a starting point for positioning GPT services in consumers' minds of this segment based on the positioning parameters "Ease of purchasing a ticket/fare payment", "Navigation (map with the position of a stop and the nearest important points)", "Point of purchase of tickets", "Internet operation", and "Visual navigation on the bus" through the right communication policy.

Along with the identified segments, the authors identified the niche of consumers of GPT services. In particular, among consumers who are dissatisfied with the perceived quality of GPT services, a sample of passengers was identified, whose share of transportation costs in the monthly budget ranges from 11 to 50%. Such results allow us to conclude that the proportion of people with low income prevails among dissatisfied respondents. Low-income consumers who are dissatisfied with the quality of services for GPT can also be considered as sub-segments, or niches in a segment with clear unmet needs for mobility and comfort of moving around the city.

From the authors' point of view, the sub-segment or niche of "dissatisfied and with low income" requires special attention on the part of the marketing management of transport companies in terms of improving the quality of the attributes of GPT services and communicating this information within the framework of the communication policy. A special approach in working with this sub-segment/niche is linked with public transport companies and their tasks of improving the social well-being of such consumers and positively changing the image of such companies in target consumers' minds.

The results obtained allow us to answer the research questions put forward in the introduction of the article.

1. The results of the desk research of 2007-2020 demonstrated that attributes of public transport

services such as reliability, safety, traffic frequency and comfort can to the greatest extent influence the dynamics of consumer satisfaction with the GPT. We concluded that frequency of traffic is the main and most critical factor influencing the overall satisfaction of consumers with the GPT.

The technological, economic, organizational and managerial work of public transport companies to ensure the frequency and regularity of traffic can be considered as a marketing product policy to improve the quality of transport services. Marketing audits should be the key activity undertaken by the marketing management of public transport companies, such as monitoring the causes of irregularity and inconsistency of the schedule, frequency of urban transport, and providing feedback to the consumers of these services.

2. The classification tree built by using the CHAID methodology within the framework of the authors' methodology allowed for the identification of six groups of consumers with different degrees of satisfaction with the GPT route network. Accordingly, different variables affect the overall satisfaction with the route network of GPT. Additional factors (quality attributes) determining the satisfaction with the GPT services quality among different groups of consumers with different degrees of satisfaction with frequency of traffic will be bus stop shelters, convenience of getting on/off the bus, and lighting at stops.

As part of tactical marketing, it is necessary to make decisions to improve such attributes of service quality as bus stop shelters, convenience of getting on/off the bus, and lighting at stops. These marketing decisions should be accompanied by an effective communication policy that will enable a change in the perception of the quality of these attributes in consumers' minds.

Understanding the critical attributes of the service quality perceived by consumers is the basis for strategic decisions of public transport companies in investing in the development of the above-mentioned attributes that are most important for target segments. Such solutions make it possible to manage customer satisfaction with the quality of GPT services and increase the attractiveness of public transport services in comparison with private transport. This will increase the mobility of the population of Moscow and reduce the environmental burden on the environment of the metropolitan area.

The limitations of this study are, first, in the study of consumer satisfaction with the quality of GPT services living in the Moscow metropolitan area. The review of scientific research conducted by the authors showed that from region to region the indicators of satisfaction with the quality of transport services and the most problematic attributes of service quality vary. Second, the limitation of the study is expressed in obtaining static data in some specific time period. The study of consumer assessments of satisfaction with the perceived quality of GPT services in the dynamics will allow taking relevant and timely decisions to improve the satisfaction with services.

The research limitations described above should be regarded as directions for future research.

First, it is a comparative study of consumer satisfaction with the quality of GPT services living in different cities/regions (territories) of the country. Such research will allow making decisions on changing the transport policy in the regions of the country to improve the consumer satisfaction with GPT not only in relation to substitutes, but also at the inter-regional level.

Second, it is a study of consumer satisfaction with the perceived quality of GPT services in different territories viewed in dynamics. Monitoring of consumer assessments of satisfaction with the perceived quality of GPT services with a constant frequency of research will make it possible to identify weaknesses in marketing and management decisions to improve the consumer satisfaction with GPT services in a timely manner and to adjust them in a timely manner.

In conclusion, the authors note that the results of this study will be useful to researchers of consumer behavior in the GPT services market, especially in terms of the methodology for studying consumer assessments of the quality of services based on the integration of methods for assessing the attributes of the quality of GPT services that affect the level of customer satisfaction. In addition, the recommendations proposed by the authors on managing customer satisfaction with the quality of GPT services through the use of a marketing concept will allow managers of public transport companies to increase the attractiveness of GPT services in the target consumers' minds.

ACKNOWLEDGEMENT

This article is part of a larger government research study, "Developing a methodology for managing competitiveness in merchandising in the digital economy". Project No. FSSW-2020-0009.

REFERENCES

Aveznova, R.F., O. Cats., Susilo, Y.O. (2017). Travel satisfaction with public transport: determinants, user classes, regional disparities and their evolution. *Transportation research. Part A., Pol. Pract*., 95: 64-84. Https://DOI: 10.1016/j.tra.2016.11.011

Barabino, B., Deiana, E, Tilocca, P. (2012). Measuring service quality in urban bus transport: a modified SERVQUAL approach. *International Journal of Quality and Service Sciences*, 4(3): 238 – 252.

Bordagaray, M., dell Olio, L., Cecin, P. (2014). Modeling user perception of bus transit quality considering user and service heterogeneity. *Transpotmentrica A: Transp. Sci.,* 10, 705-721. https://doi.org/10.1080/23249935.2013.823579

Castillo, J.M., Benitez F.G. (2012). Determining a public tratsport sarisfaction index from user service. Transpotment. A. – Transp. Sci., 9: 713-741. https://doi.org/10.1080/18128602.2011.654139

d'Ovidioa Domenico F., Leograndeb D., Schinzanob R., Violab A. (2014). A multivariant analysis of the quality of public transport services. *Procedia Economics and Finance*. 1: 238-247. doi: 10.1016/S2212-5671(14)00868-5

Eboli, L., Mazzula G. (2007). Service quality attributes affecting customer satisfaction for bus transit. *Journal of Public Transportation*, 10: 21-34. DOI: 10.5038/2375-0901.10.3.2

Eboli, L., Mazzula, G. (2011). A methodology for evaluating transit service quality based on subjective and objective measures from passenger's point of view. *Transportation Policy*. 18, 172-181. DOI: 10.1016/j.tranpol.2010.07.007

Faskhiev H.A. (2017). Consumer satisfaction and its evaluation. *Marketing in Russia and Abroad*. http://dis.ru/library/531/26994/

Felleson M., Friman, M. (2012). Perceived satisfaction with public transport service in nione European cities. *J.Transp. Res. Forum*, 47: 93-103. http://dx.doi.org/10.5399/osu/jtrf.47.3.2126

Gavrikov V.A., Penshin N.V. (2015). Formation of the competitive environment of the market of urban passengers' transportation) : *Monography* / V.A.Gavrikov, N.V.Penshin. Tambov. FGBOU VO "TGU" (TGTU), 144 .

Geetika S.N. (2010). Determinants of Customer Satisfaction on Service Quality: A Study of Railway Platforms in India. *Journal of Public Transportation*, 13(1): 97-113. http://doi.org/10.5038/2375-0901.13.1.6

Habib. K.M.N., Kattan L., Islam M.T. (2011). Model of personal attitudes towards transit service quality. *J. Adv. Transp*., 45: 271-285. https://doi.org/10.1002/atr.106

Ibrahim, A.N.H., Borhan, M.N., Zakaria, N.A., Zainal, S.K. (2019) Effectiveness of Commuter Rail Service Towards Passenger's Satisfaction: A Case study from Kuala Lumpur, Malasia. *Int. J. Eng Technol*., 8 (102): 50-55. DOI: 10.14419/ijet.v8i1.2.24871

Iseki, H., Yaulor, B.D. (2010). Style versus service? An analysis of user perceptions of transit stops and stations. *Journal of Public Transportation*, 13: 23-48. DOI: 10.5038/2375-0901.13.3.2

Jaime, A., Juan, C.M., de Dios Ortuzar, Juan, de D.O. (2018). Modeling service-specific and global transit satisfaction under travel and user heterogeneity. *Transportation Research part A Policy and Practice*, 113: 509-528. https://doi.org/10.1016/j.tra.2018.05.009

Kral, P., Janoskova, K., Kliestik, T. (2018). Key determinants of the public transport user's satisfaction. *Administratie si Management Public*, 31: 36-51. DOI: 10.24818/amp/2018.31-03

Lambin J.-J. Strategic marketing. European perspective / translation from French. Saint Petersburg. Nauka, 1996. 588.

Lopatinskaya I., Ivashkova, N., Timokhina, G., Skorobogatykh, I., Shirochenskaya, I., Grineva O. (2021). Managing the Competitiveness of Moscow Underground (Metro) Based on Consumer Satisfaction. *Journal of Eastern European Research in Business and Economics*, 2021, Article ID 126026. DOI: 10.5171/2021.126026

Li, L., Bai, Y., Song, Z., Chen, A., Wu, B. (2018). Public transportation competitiveness analysis based on current passenger loyalty. *Transportation Research Part* A*: Policy and*

Practice, 113:213-226. DOI: 10.1016/j.tra.2018.04.016

Lukina A.V., Skorobogatykh I.I., Sidorchuk R.R., Mkhitaryan S.V., Kuznetsov V.V. (2018). The study of satisfaction with the quality of transport service of the Moscow Metro. In the book: Management of Large-Scale Systems Development (MLSD'2018). Proceedings of the eleventh international conference. In 2 volumes, 82-84.

Miller, J.A., (1977). Studying Satisfaction, Modifying Models, Eliciting Expectations, Posing Problems. And Marketing Meaningful Measurements. Conceptualization and measurement of consumer satisfaction and dissatisfaction: proceedings of conference, conducted by Marketing Science Institute with support of National Science Foundation, 11 – 13. 4.1976. – Cambridge. Mass.: Marketing Science Inst. – 1977, p. 72-91.

Morozova D.V. (2018). Assessment of the importance of individual criteria in passengers' perception of the quality of transport services. In the collection: *Socio-economic problems of regional development at the present stage. Materials of the international scientific conference,* 366-370.

Mkhitaryan S.V. (2020). Analysis and modeling the level of passenger satisfaction in Moscow railway stations. In the book: *Digital economy: trends and prospects for development. Collection of abstracts of reports of the national scientific-practical conference: in two volumes*, 213-215.

Nosov A.L. (2014). Assessment of the quality of urban passenger transport. *Issues of the new economy.* 4(32), 80-86.

Oña, L., Oña, R., (2015). Quality of Service in Public Transport based on Customer Satisfaction surveys: a review and assessment of methodological approaches. *Transp. Sci.*, 49: 605-622. DOI: 10.1287/trsc.2014.0544

Oña, L., Oña, R., Eboli, L., Mazzula, G. (2013). Perceived service quality in bus transit service: a structural equation approach. *Transportation* Policy, 29: 219-226. DOI: 10.1016/j.tranpol.2013.07.001

Parasuraman, A., Zeithaml, V.A., Berry L.L. (1988) SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality. *Journal of Retailing*, 64 (1): 12-40.

Pojani, D., Stead, D. (2015). Sustainable urban transport in the developing world: beyond megacities. *Sustainability* 7 (6): 7784–7805. https://doi.org/10.3390/su7067784

Popov A.L., Grinenko S.V., Prokhodiko L.N., Beliakova E.V. (2016). *Summary analytical report on the results of monitoring the state and development of the competitive environment.*

Rayushkina A.A., Krasheninnikov A.V. (2013). Quality of services of urban passenger public transport - as a criterion for assessing its competitiveness. *Izvestia Volgograd State Technical University. Series: Land Transport Systems*, 7(21-124): 86-88

Rakhmatullina A.R. (2015). Methodological provisions for improving the quality of services of urban public transport / *Ph.D dissertation (Econ. Sciences)* defended 20.03.15, 147.

Salimova T.A., Syramina L.V. (2007). Product competitiveness as a consequence of consumer orientation. Practical marketing, 6: 22-26.

Seifullaeva M.E., Skorobogatykh I.I., Sidorchuk R.R., Shirochenskaya I.P. (2018). Foreign experience in studying the perceived quality of transport service. *Marketing in Russia and Abroad*, 5 (98) 36-48.

Sidorchuk R.R., Efimova D.M. (2015). Study of satisfaction with transport services by Moscow city passenger transport. *Marketing in Russia and abroad*, 6, 32-40.

Singh Kulwant. (2013). Eco-mobility: A Strategy for Sustainable Urban Transport. Shelter, 14 (2): 43-47.

Shinkarenko V.G., Dezhurova E.V. (2014). Assessment of customer satisfaction with transport service. *Economics of transport complex*, 23, 8-23.

Skorobogatykh, Irina, Sidorchuk, Roman, Zavyalov, Dmitry, Mkhitaryan Sergey (2019) Operational solutions for demarketing strategy to reduce traffic load in the center of a metropolis. RISC: Resources, Information, Supply and Competition. Vol.1 p. 267-275

Stutsman, J. (2002). Bus rapid transit or light rail transit – how to decide? Los Angeles case study, Transportation Research Record. *Journal of the Transportation Research Board*, 1793: 55–61. https://doi.org/10.3141/1793-08

Tarigan, A.K.M., Susilo, Y.O., Joewono, T.V. (2014). Segmentation of paratransit users based on service quality and travel behavior in Bandung, Indonesia. *Transp. Plan. Technol.*, 37: 200-218. https://doi.org/10.1080/03081060.2013.870792

Tlegenov B.N. (2017). Analysis of methods of assessment and quality indicators of urban passenger transport system. *Modern problems of science and education*.https://www.science-education.ru/ru/article/view?id=6121

Tsoy M.E., Schekoldin V.Y., Dolgykh I.V. (2017). Study of factors affecting customer satisfaction with the quality of public transport services. *Russian Entrepreneurship*, 18 (21), 3237-3260.

Tyrinopoulos, Y., Antoniou, C. (2008). Public transit user satisfaction: variability and policy implications. *Transp. Policy*, 15: 260-272. https://doi.org/10.1016/j.tranpol.2008.06.002

Tyrinopoulos, Y., Aifadopoulou, G. (2008). A complete methodology for the quality control of passenger services in the public transport business. *Eur. Transp.,* 38: 1-16. https://www.openstarts.units.it/bitstream/10077/5965/1/Tyrinopoulos_Aifadopoulou_ET38.pdf

Yaya, L.H.P., Fortiá, M.F., Canals, C.S., Marimon, F. (2014). Service quality assessment of public transport and implication role of demographic characteristics. *Public Transportation*. 7: 409-428. https://doi.org/10.1007/s12469-014-0099-7

Zavyalov D.V., Lopatinskaya I.V., Efimova D.M., Volkov D.K. (2015). Customer satisfaction in the system of transport services management. *Human Capital and Professional Education*, 4(16), 26-31.

ABOUT THE AUTHORS

Irina Skorobogatych, email: Skorobogatykh.II@rea.ru

Dr. ass. prof. Galina Timoshkina. Department of Marketing. Plekhanov Russian University of Economics, Moscow, Russia. She teaches Consumer Behavior course. Moscow, Russia.

Dr., prof. Sergey Mkhitaryan. Department of Marketing. Plekhanov Russian University of Economics, Moscow, Russia. He teaches the Statistical methods in marketing research as well Analytical marketing. He is academic director of Corporate Marketing MA program. Moscow. Russia.

Dr., prof. Irina Skorobogatykh. Head of the Department of Marketing. Plekhanov Russian University of Economics. Irina is teaching Marketing research course and she is academic director of MA program International Marketing, Moscow, Russia.

Dr., ass. prof. Natalia Ivashkova. Department of Marketing. Plekhanov Russian University of Economics, Moscow, Russia. She teaches the Strategic marketing course, as well as Marketing planning course. Moscow, Russia.

Dr., ass. prof. Irina Shirochenskaya. Department of Marketing. Plekhanov Russian University of Economics, Moscow, Russia. She teaches courses: Management of consumer loyalty and satisfaction and Management of marketing relations. Moscow, Russia.