Research of the needs of passengers of the transport infrastructure of a municipal organization

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Abstract. The article researches the needs of passengers of the transport infrastructure of a municipal organization, and analyzes the degree of satisfaction of requests from citizens. The article used the method of expert evaluation. In particular, a survey was conducted of citizens who used the municipal bus stations, as well as a conversation with the employees of the bus stations. The survey was conducted in February 2020 at two municipal bus stations in Sochi. To reduce the cost, increase the efficiency and speed of the process, a larger number of questionnaires were distributed electronically and in the paper form directly at the station. The questionnaires were also distributed through social networks and in the form of a QR code in vehicles and on the territory of bus stations. As a result, the following was investigated: passenger satisfaction with openness, completeness, and accessibility of information; passenger satisfaction with timely updating of information and compliance of information with the approved schedule; satisfaction with the comfort of the station conditions; assessment of the friendliness and courtesy of bus station employees; direct communication assessment; performance assessment.

1. Introduction
For the organization of passenger flow, transport infrastructure is always important. Bus stations deserve special attention and how the flow of passengers is organized. The organization of information flows is also important.

For the development of any system, especially a social system, it is important to consider all subsystems and factors. In social systems, it is very important to receive feedback. In the development of the transport system and the organization of passenger traffic, passengers are an important participant. Direct participants, consumers of transport services can indicate problems, important factors, and development directions for the system.

This paper is organized as follows. In section 2, we provide an overview of the related literature. In section 3, we describe the methodology used for performing the survey. The results of the survey are detailed in section 4. Finally, in section 5, the key findings are summarized and some directions for future research are suggested.

2. Prior research
Researchers pay a lot of attention to the study of passengers' perception of the transport system and transport services.
The research was made of the relationship of intercity passengers and loyalty to intercity passenger railways. The article examined a variety of factors and subsystems of the loyalty of intercity passenger rail transport (Hidayat et al., 2020).

Researchers evaluated models. Also, passengers were asked to evaluate the attitude towards intercity passenger transportation, which depended on the level of access to the railway line (Losada-Rojas et al., 2019).

Next, we can highlight the study of the effectiveness of passenger railway stations. This article used the DEA approach. It was found that the stations are bottlenecks for rail traffic. At stations and stations, traffic flows merge and diverge. In these places, many events take place simultaneously: passenger boarding, boarding and transfer, train formation, and technical inspections. Also in this study, the authors use a methodology based on analysis of data coverage, which is compared with the research of the effectiveness of ports and airports. The proposed methodology can analyze the relative “technical efficiency” of stations for processing train stops with the existing station capacity (Sameni et al., 2016).

Researchers conducted a study of passenger perception and awareness of emergency routes and procedures at airports. This research allowed us to examine the awareness and perception of passengers of tools and procedures for the emergency search of the path at the airport. In addition, the research also explores the relationship between passengers’ perceptions of a sense of security at an airport and awareness of the tools and procedures for finding a route (Shiwakoti et al., 2019).

Further, it can be noted that the researchers conducted a comparison of passenger behavior and levels of aggregate demand in the subway system using surveys of the sender and receiver and smart card data. The survey data allowed the research authors to determine the passenger flow and traffic flows for each line of the network. The route of the trips examined, including the transfer station, was determined. Also, for evaluation, the authors used smart card data in the Santiago integrated transit system (Pineda et al., 2016).

A very relevant study was conducted in 2019 on what passengers really want. In the research, the authors evaluate the value of innovation to improve the experience. Modern technology has the potential to provide more relevant information, as well as the provision of individual services for the training of passengers. Accordingly, the development of information can improve the experience of rail transportation. To develop this direction, information is needed on what innovations and services travelers prefer. The purpose of this research was to understand the value that passengers attach to technological innovation to improve the overall experience of passengers. (Oliveira et al., 2019).

3. Methodology
Consider research methods.

To research the needs of passengers of the transport infrastructure of a municipal organization, we use an analysis of the degree of satisfaction of requests from serviced citizens and conduct an expert assessment method. In particular, a survey was conducted of citizens who used the municipal bus stations, as well as a conversation with the employees of the bus stations.

The survey was conducted in February 2020 at two municipal bus stations in Sochi. To reduce the cost, increase the efficiency and speed of the process, a larger number of questionnaires were distributed electronically and in paper form directly at the station. The questionnaires were also distributed through social networks and in the form of a qr code in vehicles and on the territory of bus stations.

A total of 170 people took part in the survey. To increase the representativeness of the sample, the questionnaires were distributed proportionally among the citizens who visited. A question was added to the questionnaire to determine the representativeness of the sample. The questionnaire consisted of 10 questions.

The development of questions to the questionnaire and criteria for assessment was determined on the basis of a study of publications and regulatory documents.
4. Results

To research the needs of passengers of the transport infrastructure of a municipal organization, we use an analysis of the degree of satisfaction of requests from serviced citizens and conduct an expert assessment method.

60% of the passengers surveyed are satisfied with the openness, completeness, and accessibility of information about the activities of the bus stations located on information stands in the station premises 40% are not (Figure 1).

44% of respondents are also not satisfied with the openness, completeness and accessibility of information about the activities of the bus stations posted on the official website (Figure 2).

For 59% respondents, trips took place in accordance with the approved work schedule and transport work schedule (Figure 3).
Figure 3. Satisfaction with timeliness with the approved work schedule and transport work schedule.

Most respondents are satisfied with the comfort of the conditions (premises, existing equipment, furniture, etc.) in the waiting rooms of bus stations (Figure 4):

Figure 4. Satisfaction with the comfort of the station conditions.

83% of respondents said they were satisfied with the friendliness and courtesy of the bus station employees (Figure 5):
Figure 5. Assessment of the friendliness and courtesy of the employees of the bus stations.

61% of respondents said that they were satisfied with informing about direct contact (Figure 6).

Figure 6. Evaluation of information in direct contact.

Then, the respondents rated the quality of the bus station activities on a 10-point scale from 1 to 10, 1 - unsatisfactory, 10 - excellent (Table 1).

The quality can be everything that is perceived by the consumer.

The average assessment of the quality of the activities of bus stations by respondents was 7.05 points, which is a very positive indicator.

Table 1. Quality assessment of the implementation of bus stations.

| №  | Criterion                                                      | Evaluation |
|----|---------------------------------------------------------------|------------|
| 1  | degree of accessibility:                                      | 7          |
|    | - convenience of location                                    | 9          |
|    | - ease of access to information                               | 6          |
|    | - the ability to quickly communicate when a problem occurs;  | 6          |
| 2  | confidence:                                                   | 7          |
|    | - reputation, honesty,                                        | 7          |
| 3  | staff competence:                                             | 8          |
|    | - staff skills and knowledge                                  | 8          |
|    | - professionalism of actions and decisions;                  | 8          |
| 4  | communication level:                                          | 6.25       |
|    | - the ability to listen and transmit information to him in a  | 7          |
6 to him,
- willingness to avoid professional jargon, 6
- hear in case of a complaint, 7
- notification of changes related to the nature of the work; 5
5 employee reaction rate:
- desire to help, willingness to meet at a convenient time; 6
6 courtesy of employees
- courtesy, courtesy, 7
- attentiveness 7
- friendliness; 7
Total 7.05

If we consider a more detailed assessment of all indicators, then the lowest scores received indicators related to communication and information.

Further, as part of the work, a conversation was held with bus station employees who work in the service sector about the processes of organizing bus station activities. As a result of the conversation, employees identified the main problems in their work.

The statistics and reporting documents of the bus stations in which the study was conducted were studied, as a result, it can be noted that the number of passengers over the past three years has increased. Financial support is positive and stable. There is complete staffing with the minimum necessary property and equipment. The staff is staffed and ongoing training.

According to the results of the survey, many respondents noted a lack of information on the site, its complexity, and the need for more visual information.

Also, when interviewing citizens, many pointed to the problem of non-compliance with the schedule, late updating of information on the site, or late notification of changes in the schedule, there is not always information in the database on the site.

Also, it is worth mentioning separately the problem with citizens' notifications of changes in the schedule or problems encountered with transport. As the respondents noted, often the notice came after the event, or when the deadline ended. This problem matters because it creates restrictions on the rights of passengers.

Also, according to the results of a conversation with employees, monitoring and taking into account the main labor processes, the most significant problem is outdated personal computers, which, when using all work programs of employees, take a very long time and process operations, as a result, employees constantly experience small downtimes and delays in completing tasks.

Thus, using the methods of observation, questionnaires, comparative analysis, and accounting of working hours, the following problems can be distinguished:

- The need for additional information on the station website;
- Not constant observance of the deadlines for updating schedules, flights, and databases on the website of municipal stations;
- Not constant observance of the deadlines for sending and receiving notifications and notifications, the need to increase the speed of information exchange.
- Material support, in particular personal computers, does not meet the modern requirement of speed and the use of several tasks, processes, and software at the same time.

Let us consider the directions for optimizing the processes of organizing the activities of bus stations that passengers suggested in the responses to the questionnaire. To solve the identified problems, we will offer the following solutions:

- Supplement the information on the site taking into account the wishes of citizens and the experience of other bus stations;
• Develop a justification for the need to update personal computers and send a request with justification to the municipal administration;
• Duplicate notifications, notifications by mobile messages or e-mail;
• Systematic monitoring of the completeness and accuracy of entering information into databases, into systems, and accordingly on the station website.
• Conduct an analysis of work processes and tasks, use the method of planning and organization of the work process - the Eisenhower matrix, and use special software to automate the accounting of work tasks, processes, and time control.

This will allow systematic input of information into programs, bases, subsystems, and accordingly, to the station website in full and on time.

5. Conclusion
It should be noted that the use of the social method in transport management is always relevant, especially in the era of modern technologies, which allow cheaper and faster feedback from passengers.

Thus, using the methods, observations, questionnaires, comparative analysis and accounting of working hours, the following problems can be distinguished: The need for additional information on the station website; Not constant observance of the terms for updating the schedule, flights and databases on the website of municipal stations; Not constant observance of the deadlines for sending and receiving notifications and notifications, the need to increase the speed of information exchange. Material support, in particular personal computers, does not meet the modern requirement of speed and the use of several tasks, processes and software simultaneously.

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