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Models of Estimation of Application of Passenger Service Quality Parameters

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Abstract

When assessing the passenger service quality by consumers, trip time appear to be the most important, and time of waiting for transport appears to be the most dependent on the work organization. In a large city, when delays beyond the control of the driver often occur, the level of traffic regularity becomes lower, and passengers want to be sure that their trips will not take more time than it was expected. Therefore, it would be advisable to additionally use an estimate of reliability — probability of transport arrival within the required intervals. The paper presents models of evaluation of the use and application of such quality indicators as regularity and reliability of transport. To improve the transport service quality, it is necessary to use the advanced tools of organization, management, monitoring, and coordination of passenger transportation.

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1. Main text

Analysis of best practices of organization and management of urban passenger transportation shows that, in the current situation, the main objective of the public transport is not only to provide services in the required quantity, but also to meet the growing demands of the population to the passenger service quality. The assessment of the passenger service quality is affected by various factors evaluated by quality indicators. Therefore, the goal of this study is to

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examine indicators and determine the range of application of individual indicators in the evaluation of the passenger service quality. Subject of the study is models of experimental and analytical evaluation of the existing quality indicator — transport regularity, and the indicator proposed by us — transport reliability.

Considering the advantages of the public transport in saving urban areas and reducing negative impact of transport on the environment, etc., local authorities set the following main goal: to involve the population in greater use of public transport. This cannot be achieved without improving the quality of urban passenger transportation services. For this purpose, the following measures are taken:

- minimum time of trip;
- guaranteed availability of transport infrastructure;
- offer of various transport services;
- providing comfort upon traveling, waiting, boarding, deboarding, and transfer;
- rapid provision of accessible information about transport services;
- convenient payment for transport services;
- use of sustainable modes of transport;
- safety of urban passenger transport, etc.

Level of the passenger service quality is assessed using the following indicators:

- safety;
- regularity;
- information support;
- comfort;
- availability.

The conducted studies [Semchugova (2003, 2009, 2009¹, 2012), Zyryanov et al. (2012)] of various quality parameters from the viewpoint of consumers show that the most significant parameter is a trip time.

The trip time consists of the following elements: 1) time of reaching the stop, 2) time of waiting for a vehicle, 3) time of trip in a vehicle, 4) time of transfer, 5) time of reaching the point of destination. If we consider each of these elements, the waiting time and the time of transfer are the most dependent on the organization of work of the carrier.

Indeed, changing the parameters of the first and the last elements depends on the layout of the urban area, optimizing the route network, dislocation of main roads and stops, but works on improving the current situation are performed quite seldom. The trip time depends on a chosen route and traffic organization, i.e. these parameters practically do not depend on the quality of work of the transport company.

It is important for a passenger to be sure that a trip will not take more time than it was expected, especially if a passenger needs to be in time for an important meeting, train, plane, etc. For example, a person knows that the walk to the bus stop takes 4 minutes, the bus trip takes about 30 minutes, the time of waiting for the bus lasts no more than 5 minutes, the walk from the bus stop to the point of destination takes 6 minutes, i.e. he or she will reach the point of destination in 45 minutes. Therefore, the start of trip on the route will be planned in accordance with the expected time. What will happen if the time of waiting for the transport lasts 20 minutes? The trip time will increase to 1 hour, which in our example will amount to an increase of 33% and, as a result, the delay, in some cases irretrievable.

In a large city, when delays beyond the control of the driver often occur, the level of traffic regularity becomes lower. In this case, even the information display showing the real time of the transport arrival to the stop will not assist in trip planning, which is carried out in advance.

In this regard, when evaluating the passenger service quality, it is offered to use not only the traffic regularity indicator, but also the transport reliability indicator.

To justify the recommendations, calculations of regularity and reliability are given below.

1. According to a bus schedule, interval of arrival of buses to the stop is 10 minutes. Initial data are time of the vehicle arrival according to the schedule and actual time of the vehicle arrival to the stop. In order to calculate the regularity indicators, it is necessary to calculate deviations of the actual arrival from the scheduled one. In order to calculate the reliability, it is necessary to establish intervals and deviations from the mean interval (Table 1).

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