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Foreign Experience of Assessing the Quality and Reliability of the Functioning of Urban Public Passenger Transport

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Abstract: In recent years, the demand for urban public passenger transport services has increased markedly, this is due to the transport policy of cities in many countries, aimed at the priority development of urban public passenger transport systems. The article discusses the analysis of foreign experience in assessing the quality and reliability of the operation of urban public passenger transport.

Keywords: Urban public passenger transport, quality and reliability assessments, stopping point, population mobility, information boards for stops, vehicles, development of the transport network, traffic schedule, traffic interval.

Introduction. In the modern world, the improvement of public passenger transport guarantees its accessibility to different social groups of the population and at the same time reduces the load on the road network. At the same time, there is an active growth in the mobility of the population using individual transport [1,2]. Thus, it is necessary to pay special attention to the quality of service for public transport passengers [3,4]. Analyzing aspects related to the quality of public transport, the following components can be distinguished:

- Affordability: the total cost of traveling using a particular mode of transport;
- Availability in time is the number of possible departures from a stopping point, within a certain time interval. This aspect depends on the timetable on the route. Usually, availability over time decreases markedly during peak periods. In inter-peak periods, no restrictions are observed [5,6,7];
- accessibility in space - depends on the state of development of the transport network;
- travel time is the total time spent from approaching the stopping point to arrival at the destination, including waiting time for the vehicle;
- comfort - the level of comfort is an important aspect of quality, both for the vehicle and for the stopping point;
- Reliability is expressed in observance of the rolling stock traffic schedule (traffic interval).

\Results and its discussion. To reflect the hierarchy of user interests, the authors of Van Hagen M., Heiligers M. [8,9,10,11], Van Oort N. [12] provide "Maslow's pyramid for public transport" (Figure 1). All these aspects, similar to Maslow's hierarchy, are ranked in the form of a pyramid.

The pyramid of passenger needs reflects the perception of the quality of services offered by the carrier. The base of the pyramid forms "reliability and security"[13,14]. Public transport is a source of increased risk and therefore requires increased

attention. For passengers, social security is a sense of security from such crimes as hooliganism, vandalism, pickpocketing [15,16,17].

Reliability refers to adherence to public transport schedules and providing passengers with additional information. For example, information boards for stops, which are designed to display information about the time before the arrival of vehicles of various routes at the stopping point [18].

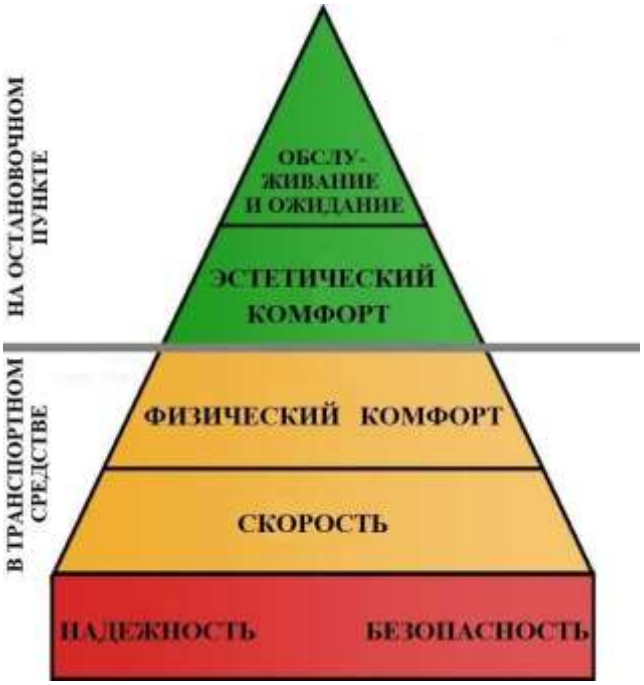

Figure 1. - Maslow's pyramid for public transport

As already established, the cost of travel time is the main criterion for evaluating urban public transport users, that is, most of them choose the shortest route between the point of departure and arrival.

If reliability, safety, and speed satisfy the needs of passengers in the process of movement, then attention is paid to physical comfort [19]. To satisfy this aspect, you need: waiting pavilions, recreation areas, various fast food outlets, etc. In addition to all this, the perception of the quality of the service provided is influenced by visual aspects: architecture, design, cleanliness, materials used, colors, smell, music.

Figure 2 shows the hierarchy of passenger satisfaction depending on the quality of service [20].

If the quality of service exceeds expectations, the passenger will experience positive emotions and the service will be rated as “good. If the quality of service is worse than expected, on the contrary, the consumer will evaluate the service negatively. In the event that consumers evaluate the quality of service for granted, i.e. reality coincides with their expectations, such an assessment will be adequate. This level of quality is stable and constant. An acceptable level of quality that is adaptable to changing circumstances is considered flexible. The area between the expected and received quality of service is called the tolerance zone [21]

Thus, in the operation of public transport, it is necessary to pay great attention to meeting the needs of passengers. The main task of the public transport system in our time is to make it more attractive to residents. And only with the maximum satisfaction of the needs of users, public transport will be able to compete with personal transport, which is an urgent problem for most cities in modern Uzbekistan.

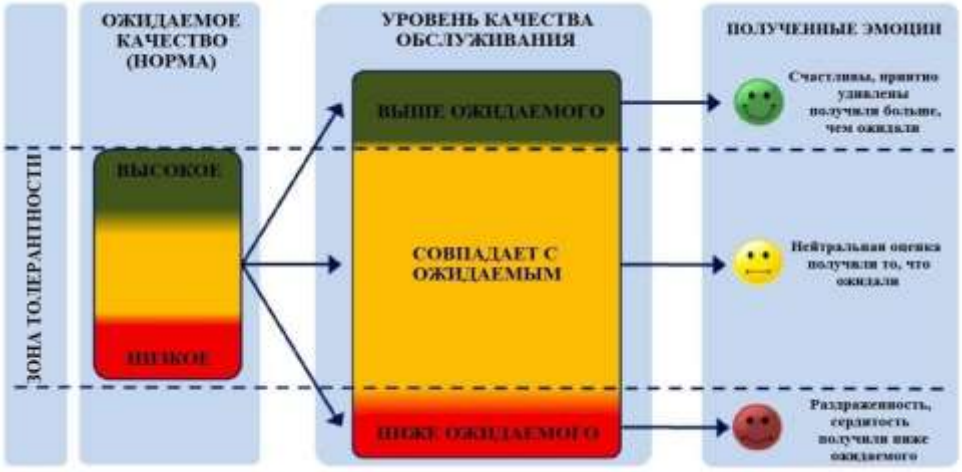

Figure 2 - Expected quality, service level and emotions

In foreign practice, the assessment of the reliability of the functioning of urban public passenger transport is carried out on the basis of methods for studying the duration of movement and identifying regression dependencies between the average duration of movement and the duration of movement of the rolling stock of urban public passenger transport.

In their studies, the authors Lomax T., Schrank D., Turner S., Margiotta R. [114] characterize the conceptual sources that affect the variation in the duration of movement. At the same time, the concept of "normal duration of movement" is taken as a basis, with respect to which the assessment of influencing parameters is carried out.

In the studies of El-Geneidy A., Hourdos J., Horning J. [22], data on the duration of movement along the route are used for analysis, and the road network of the route is analyzed.

The functional dependence between the characteristics of the bus movement along the studied routes and the characteristics of the movement of passenger cars can be described as a function of the duration of movement on the characteristics of the route [23].

Conclusions. A regression model to determine the impact of different route characteristics on travel time for both buses and cars is based on segment analysis data. In this model, the duration of movement (in seconds) along the route segment is used as a dependent variable [24,25].

In foreign practice, the assessment of the reliability of the operation of urban public passenger transport is carried out on the basis of statistical indicators of the duration of movement and the identification of regression dependencies between:

• the average duration of the traffic flow and the duration of the movement of the rolling stock of urban public passenger transport;

• duration of traffic and characteristics of the road network.

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