Dependence of the Passenger's Functional State Changing from the Public Transport Service Quality

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Abstract − one of the requirements of contemporaneity is the quality of public transport service. Regularity of traffic reliability, duration of trip, comfort, traffic safety, availability of stop are all those and many others factors that influence the quality of public transport service. There is the example of the influence of quality index of maintenance of passengers on their functional state.

Keywords − quality of public transport service, traffic safety, comfort, information support on transport, functional state.

Introduction

The studing of quality of public transport service – is one of the most important point that is before the necessities of society in the sphere of transport. The quality of public transport service depends on the employment psychophysiological state of a person etc…, all these factors influence the rhythm of different spheres of production and service. The improper quality of transport service causes the decline of passenger and bad mood at all.

Public transport service quality

According to many ideas of the specialists about the digree of quality of public transport service they decided to conduct a complex estimation of public transport that was offered by Shabanow [1]. The scientist takes into account such the points: the duration of trip, regularity of traffic, probability of faultless work of public transport, comfort, the price index and the level of informative providing.

$$S_{service} = S_1^{k1} \cdot S_2^{k2} \cdot S_3^{k3} \cdot S_4^{k4} \cdot S_5^{k5} \cdot S_6^{k6}, \qquad (1)$$

where S_1^{k1} – reliability of movement in accordance with the schedule of movement (travel time);

S_2^{k2} – accessibility (frequency of public transport movement);

S_3^{k3} – safety (probability of non-failure work of public transport);

S_4^{k4} – comfort (travel quality);

S_5^{k5} – cost indicator (the amount of transport tariff);

S_6^{k6} – indicator of the level of information support;

There was done the analyse of this formula and it was modified according to our research. According to the rout researches of city passenger transport there are chosen the neassary skills to define the indexes of quality (Table 1).

There were done a lot of researches on the 10 routs with the help of «Polar H7» and HRV Lite in the real condition to define the influence of quality of public transport service. These researches were done by two persons at each rout. Before the getting to the bus at the last bus stop one of the researches puts on the «Polar H7» and placed the single seat on the right side (near the door) and begins to put down the facts. The other researcher asked the other passengers in the bus about quality of public transport service on this rout.

Indexes of quality

Rout	Indexes of quality									
	Actual trip duration, min	The minimum possible trip duratio, min	Actual number of buses, units	Estimated number of buses, units	Actual number of order working buses, units	Number of buses that should get on the route, units	Amount of passengers' ratings about comfort, points	maximum number of passengers' ratings about comfort, points	The actual quality of information, points	Maximum possible quality of information, points
51_{dir}	70	68	5	8	16	19	15	25	92	117
51_{rev}	66	68	7	8	15	19	20	25	89	105
16_{dir}	60	63	6	9	13	13	17	25	59	75
16_{rev}	57	63	5	9	12	13	19	25	58	78

The same facts are done foe the routs 30,13,3A,39,18,41,9,2A (of both sides). The results of the quality of the service are shown in Fig. 1.
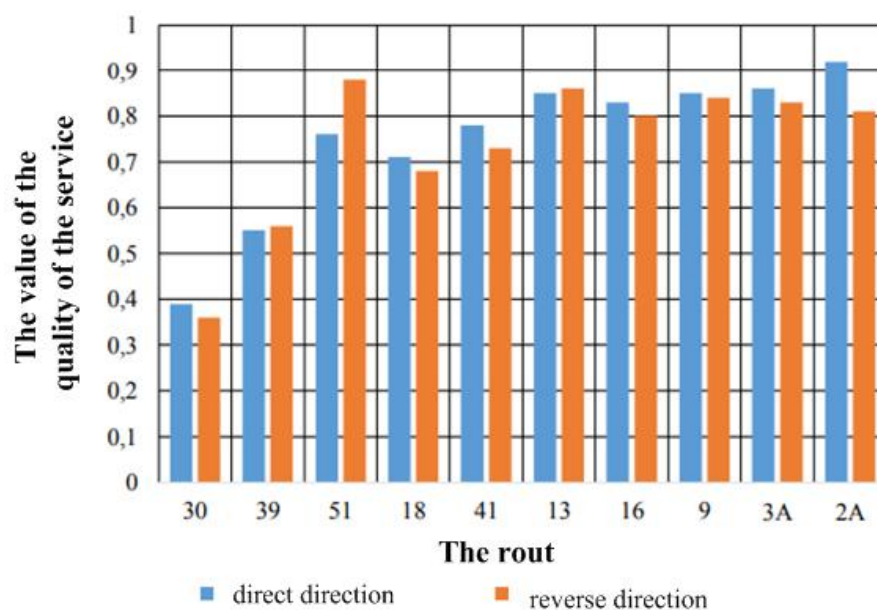

Fig. 1. Index of quality of public transport service.

According to Fig. 1 you can see that the quality of public transport service is hastated between 0.36 and 0.92. This chart shows the change of this fact according to the rout from the «worst» to the «best».

Functional state – is the complex of facts that charactericed the man's possibility to go some action in the certain condition. [2] Also it is the possibility to save the capacity level of the bad influence of invironment. It is very important to the passenger to save the functional state after the journey by the public transport and to do his job correctly after this. That means that functional state of the person can show the capacity level of him.

This work shows the level of people's fatigue by transport like IRSA. Index of regular system activity (IRSA) – it is the sum of the conditional points according to different points of HRV. The value of this is shown by the point from 1 to 10 and shows the functional state of the passenger, where 1 is the physical norm and 10 – blowing the adaptation off. [3]
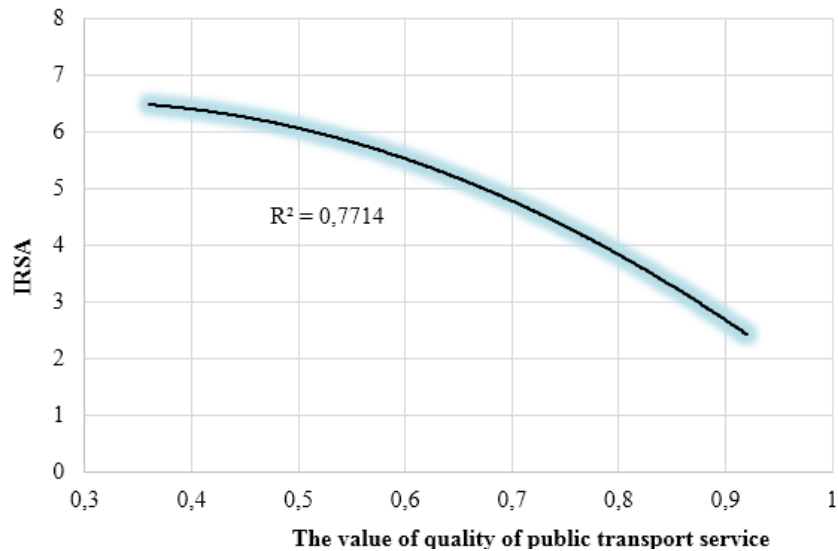
Fig. 2. Dependence IRSA of the passenger from quality of public transport.

It is decided that IRSA of a passenger changes inversely proportional to the quality of public transport service city passenger transport. IRSA reaches the maximal value at the rout with the smallest level of the quality of public transport service, but minimal value are with the highest level of quality. It is set that when the index of quality increases to 0.9, IRSA falls to 2-3 points.

So this crooked line gives us the possibility to say that the quality of public transport service influences on the FS of a passenger.

Conclusion

It is well-proven that the change of FS of the passenger depends on the quality of public transport service. The smallest level of the passenger's tension is at the rout with the highest level of the quality of the public transport service (0.85-0.92). Analysing the facts of the researches it is well-proven that the level of quality of transport service is getting worse. It can be explain that our transport is often overcrowded. It is decided that when the quality of transport service is better, the tension of the passengers will decrease and the FS will be better too.

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