



IMPROVING THE QUALITY OF PASSENGER SERVICE IN CITY PUBLIC TRANSPORT

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Abstract: in connection with the growth of the city's population and the improvement of the standard of living of the population, the demand for quality service of public transport also increases. Effective organization of city public transport services is important for passenger activity and city air traffic.

In this article, analyzes are presented and recommendations are made regarding the rational placement of bus stops in the studied area and improvement of their activity in passenger transportation.

Keywords: public transport, number of trips, passenger turnover, number of rounds per day, Geo Tracker software

1. Introduction. Today, large cities cannot be imagined without well-organized passenger transport. Urban passenger transport of modern large cities is a complex multi-sectoral economy that combines various types of transport, among which directional public transport occupies a special place.

It is necessary to increase the provision of passenger transport vehicles in our region, to increase the number of public transport routes and to improve the service quality of the existing ones.

When considering the main content of the engineering activity on the organization of the movement, it is noted the need to evaluate the results of the implemented measures according to quantitative indicators. At the same time, it is appropriate to use the method of comparing "before" and "after" indicators to ensure the quality of using public transport. This is due to the variety of specific traffic conditions, and therefore it is impossible to set the absolute values of the evaluation criteria, and it is necessary to analyze the changes in the indicators resulting from the improvement of the traffic organization. Improvement of public transport, i.e. bus traffic, requires the development of specific and comprehensive measures on city streets.

As a solution to such problems, it is necessary to use various analytical tracking account books and Geo Tracker software to effectively organize public transport flow management. It is also necessary to statistically observe and analyze the elements of logistic operations of the transportation process.

2. Literature review.

Many outstanding scientists of foreign countries and our country paid attention to the improvement of technologies of passenger transportation in city buses and the creation of scientific bases for increasing the quality of service. In particular, the following scientists conducted research in this field: E. Ingrid, M. Mistretta, A. Monzon, Bashir Shalaik, Richard

Anderson, A. Bristow, M. E. Antoshvili, I. V. Spirin, A. V. Shabanov, V. ... Butaev, K.B. Nasretidinov, L.A. Akhmetov, V.S. Moon, K.M. Nazarov, A.A. Nazarov, B.I. Abdullaev and others.

In order to ensure the transportation needs of passengers in the city public transport, as well as to provide them with quality service, vehicles should have information, ease of movement, high speed of movement, adherence to the route time, safety, regularity, sufficient heating in the autumn-winter season and other features (I.V. Spirin, 2006) is necessary.

The main indicator for evaluating the quality of service in buses is the capacity utilization coefficient, which has been improved as an integral evaluation criterion (B.I.Abdullaev, 2019). Urban mobility in many developed countries is one of the main challenges facing the world's urban population. It has been shown that an effectively organized public transport system is a good alternative option for this problem, i.e. ensuring the mobility of a large number of people (W. H. M. Bins Ely, J. M. Oliveira, L. Logsdon, 2012).

The socio-economic quality of passenger transport is largely determined on the basis of the following parameters (Sh.A. Botaev, et al., 2012): route network density, route coefficient indicating the ratio of the length of passenger transport routes to the total length of the network, vehicles per 1000 people number, traffic plane, travel time, use of the capacity of the vehicle, coefficient of changing directions during the arrival.

Proper organization of passenger transportation is one of the indicators determining the standard of living of the population (I.V.Spirin, 2008).

General problems that are more often observed in the public transport of the city nowadays are also present in the working conditions of the public transport of the city of Termiz. For example, non-observance of movement intervals, lack of designated intermediate stops, congestion in public transport (passengers are boarded more than the norm, especially at rush hour), insufficient culture of interaction between driver and passenger, and similar problems are evident (Kuziyev A., U. , Mirzayev A. Sh., Kholboyev Sh., 2022).

3. Research methodology.

Some shortcomings in the organization of public transport and neglect of quality service in the routes cause inconvenience for passengers. In order to improve the quality of service in public transport, first of all, it is necessary to monitor the flow of passengers on the routes and analyze the received data. In this article, the bus route Termiz city No. 15 "Termiz bus station-northern bus station" was chosen as an object.

The route is an intra-city bus route, its total length is 11 km, and it has been operating since 2019. 24 ISUZI buses serve the route. The average technical speed is 40 km/h.

The following information should be studied in order to regularly analyze the transportation conditions and organize the effective temperature of the buses when describing the population's demand for transportation:

- passenger flow;
- passenger exchange;
- distribution of passengers between the initial and final stops;
- the average distance of passenger transportation in each route and in the general bus network.

Passenger flow refers to the number of passengers traveling in one direction in a certain period of time.

The flow of passengers on the above-mentioned bus route was determined using the ticket method and the Geo Tracker software.

In the form of a ticket, the ticket is given to the passenger together with the ticket at the entrance to the bus or the ticket itself, and the ticket is returned to the cashier when exiting the bus. With the help of this method, information such as passenger flow, direction of movement of passengers, average transportation distance, number of passengers transported between stations is determined.



Figure 1. View of the bus route map in Geo Tracker (route 15).

The Geo Tracker program is used in parallel with the ticket method and determines a number of parameters of the bus during the movement of the route:

- the distance of the bus route;
- road map;
- average speed;
- maximum speed;
- time in the direction;
- coordinates of places where passengers were picked up or dropped off at each stop.

It is possible to track the movement, determine the average distance traveled and the time spent on the bus. When the Geo Tracker software is used in parallel with the ticket method, it will be possible to track at which points the passenger flow increases and decreases. The data obtained in the Geo Tracker program on the above-mentioned route were analyzed, and as a result, a new option for placing stops on the route was proposed (Table 1).

Table 1

The schedule of bus stops on the Termiz bus station-North bus station

№	Name of stations	Distance, km	
		Between the points	From the starting point
1	Northern bus station	0	0
2	Surkhan market	1.1	1.1
3	Termiz State University	1.6	2.7
4	Communication station	0.82	3.52
5	Jubilee market	0.25	3.77
6	Presidential School	0.79	4.56
7	Railway station	0.47	5.03
8	Oncology hospital	0.64	5.67

9	Speed dispensary	0.48	6.15
10	Famous diagnostic clinic	1.25	7.4
11	Imam Termizi International Research Center	0.7	8.1
12	Academician	0.7	8.71
13	Termiz gas station	2.39	11.1

4. Analysis and discussion of results.

From the analysis, it is known that there are many bus stops in the current condition of bus route 15. As a result, more time was spent on the bus moving on the route, which in turn led to a decrease in the speed of movement. On the route, it stopped 34 times at intermediate stops during one journey (one way) for passengers to get on and off the bus. This leads to an increase in movement time and a decrease in operational speed.

Based on the calculations made using the Geo Tracker program, the rational placement of intermediate stops was ensured. The number of intermediate stops was reduced to 23 compared to the current number of stops (34) (currently, the number of intermediate stops is 11).

Information on technical and operational indicators of buses on the route is presented (Table 2). The rational placement of intermediate stops leads to the improvement of many factors, including the increase of the speed of the bus, the reduction of the travel time, the reduction of the operating costs of the buses, and similar indicators. Table 2

Technical and operational indicators of buses on the route

Technical indicators (initial)		Technical indicators (next)	
Walking distance	11.18 km	Walking distance	11.18 km
Walking time	00:42:21 hours	Walking time	00:31:28 hours
Maximum speed	45 km/h	Maximum speed	54 km/h
Average speed	16.52 km/h	Average speed	24.77 km/h
Time in action	00:39:01 hours	Time in action	00:30:52 hours
Average speed in motion	18.43 km/h	Average speed in motion	25.22 km/h
Number of stops	34	Number of stops	11
Time spent at each stop	1 minute	Time spent at each stop	1 minute

5. Conclusions and suggestions.

Based on the analysis presented above, it is necessary to improve the stops of public transport routes in order to improve the quality of passenger transportation. This event is the basis for ensuring the following indicators:

- the total time of passengers going to their destination by public transport is saved;
 - it is ensured that buses stop at designated stops;
 - the operating speed of buses will increase;
 - the distance of the buses before the repair will be improved;
- quality indicators of transport services will improve.

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