



Modern Methods of Determining the Flow of Passengers in the Process of Public Transport

S. Q. Azimov

Andijon machine-building institute, Assistant teacher, Uzbekistan

D. M. Bahromjonova, B. A. Yusupov

Andijon machine-building institute, Student, Uzbekistan

Abstract: *This article analyzes the methods of determining the flow of passengers, which is considered an important indicator for improving the quality of urban public transport services and organizing movement intervals correctly. It is based on the fact that the use of an automated calculation system in the study of the flow of passengers is effective in determining the number of rolling stock on the routes and correctly choosing their movement intervals. The more vehicles there are on the route and the shorter the distance between them, the better the quality of passenger transport service.*

Keywords: *transport, passenger, safety, public transport, passenger flow, movement interval, automated computing systems.*

The importance of road transport in the socio-economic development of our country and in the transportation of goods and passengers was considered. This naturally leads to problems in ensuring traffic safety on roads and city streets and providing transport services to the population. Public transport is a tool that brings people closer together and has a direct impact on the mood of the population. In the past 10 months, more than 3,000 appeals have been made to People's reception centers on this issue, which shows that there are many shortcomings in the field. According to estimates, only 4.4 million or 22 percent of about 20 million passengers per day in our country use public transport. This indicator is even lower in Andijan, Kashkadarya, Namangan, Khorezm, Samarkand, Fergana, Bukhara and Tashkent regions. 1 thousand 200 villages in the direction to the district center not covered by public transport [1].

The fact that the fleet of public transport vehicles is insufficient or outdated, some of them have passed their service life, and the movement intervals are not properly organized means that there are many things that need to be solved in this regard. This, in turn, means that special attention should be paid to the need to optimize city public transport routes.

In the city of Jizzakh, the importance of buses and minibuses, which are considered public transport vehicles, is very important in providing services to passengers. The increase in the amount of traffic on the streets of the city, especially during the peak hours of the day, is the reason for the increase in the delay time of public transport vehicles, as a result of which the speed of movement decreases, in turn, disruptions in the regularity of traffic, passengers are waiting. To solve these problems, first of all, it is necessary to study the flow of passengers in public transport, to determine the intervals of movement in the directions in accordance with the flow of passengers, and to properly organize the movement [2].

In order to provide effective transport services to passengers, it is necessary to systematically carry out information about the flow of passengers. According to the main purposes of obtaining



information, the study of passenger traffic is divided into two classes. The first includes surveys aimed at determining the needs of the population for transportation, and the second is related to the improvement of the existing system of transportation services.

The study of the need for transport provides information about the laws of the formation of the demand for passenger transportation, the transport service survey provides information about the level of satisfaction of the population with the transport services with the existing system.

Today, the transition to a market economy has led to a further increase in the transport mobility of the population. The flow of passengers, its quantity and other characteristics depend primarily on the transport mobility of the population. Transport mobility of the population refers to the amount of transport use in a certain period of time (usually one year). The number and time of public transport use depends on the purpose of using the transport (work, study, recreation, etc.). Research shows that 60 - In 65% of cases, the population uses transport to go to work or study [3].

Passengers who need to be transported in a certain direction and part (section) of roads are called passenger flow. In order to fully satisfy the public's demand for transportation and provide them with high-quality transport services, the following information about the flow of passengers and their characteristics is needed:

1. Volume of passenger transportation in all directions.
2. Distribution of the flow of passengers according to sections of the route (between stops).
3. The distribution of the volume of passenger flow by hours of the day.
4. Passenger circulation.
5. Average passenger transportation distance.
6. Interchangeability coefficient of passengers.

When studying the flow of passengers, they can be depicted in the form of a graph, map, cartogram, cyclogram or table. The flow of passengers is unevenly distributed according to the length of the route and hours of the day [2].

If we look at the changes in the passenger flow by hours of the day, we can observe two periods with the largest passenger flow, which are the morning commute and the evening commute. 'times to return from winter. These periods are called peak times [4].

The flow of passengers can be studied by general methods (the entire city, district, or all buses traveling on the route are covered) or by a separate sampling method (a part of the buses traveling on the city, district, or route). Which method to use is chosen based on the purpose of determining the flow of passengers.

There are several common ways to study passenger flow, and they are as follows. .

Questionnaire method. In this way, special questionnaires are prepared and distributed to the population to study the flow of passengers. In the questionnaire, questions such as how many times and for what purpose each resident uses the transport service, in which direction and how far they go (Table 2) are written in the questionnaire. The obtained information is used to assess the quality of transport services to the population, to develop a plan for the development of the transport network in the future, to choose a type of transport and to solve issues such as the city transport plan.

While the questionnaire method is the best tool for solving the current issues of transport, it also has some disadvantages. These disadvantages include:

1. The complexity of conducting a questionnaire survey (preparing questionnaires, distributing them to each household and collecting them again).
2. A lot of time is spent on processing the application data.
3. Not being able to accurately show the flow of passengers on the routes during the "peak" time of the day and the largest values of traffic movement and the distribution of the route by sections.

Accounts are made separately according to the direction of traffic (forward direction, reverse direction). The preliminary analysis of passenger data will be the basis for making the first proposals about which type of bus route should be opened in the considered direction. The main criterion for choosing a route is the level of occupancy of buses with passengers. In this case, the type of bus route should be chosen in such a way that the level of capacity utilization of the bus is high (the profitability of the route is ensured), while at the same time the comfort for passengers is provided (the level of capacity utilization is don't go overboard).

Eye observation method. This method is quite simple and at the same time approximate, and is used to study the flow of passengers at the most loaded stations of the route. For this, counters stand at stops and estimate how many passengers are inside the bus using a six-point system (Fig.):

- ✓ 1 point - more than half of the seats are empty;
- ✓ 2 points - all seats are occupied;
- ✓ 3 points - all seats are occupied and half of the standing areas are occupied;
- ✓ 4 points - the capacity of the bus is almost fully used (2 passengers fit into 1 m² of free space);
- ✓ 5 points - the capacity of the bus is fully used (4 passengers fit into 1 m² of free space);
- ✓ 6 points - the bus is full and passengers cannot get on it (8 passengers fit into 1 m² of free space) [5].

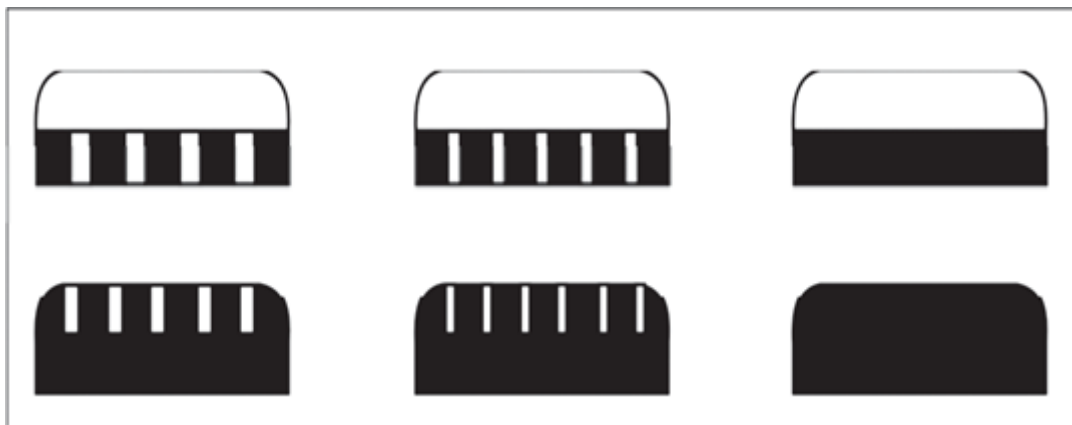


Figure 1. Bus occupancy scores at a glance.

When using this method, in order to correctly determine how many passengers are traveling in the vehicle, it is necessary to pay special attention to the model of the bus, the fact that the seats have not changed compared to the ones in the factory that produced the bus. Since the method of visual observation is simple and requires relatively little work, it is appropriate to use it regularly in each direction to study the flow of passengers by hours of the day, days of the week, and seasons of the year [6].



Table method. The schedule method is usually used to study the flow of passengers in all types of urban passenger transport (with the exception of selected routes) on any working day of the week (usually Wednesday and Thursday) [2].

If there is a shortage of employees in transport companies, college and institute students are also involved.

Special tables are prepared for observation and are multiplied in sufficient quantity. A group of accountants and its leader are appointed for several directions.

Before starting the calculation, the group leaders give instructions to the accountants on the rules for filling out the table. At the same time, some organizational issues should be resolved in order to study the flow of passengers. For example, where the accountants will gather on the day of observation, the places where the account will be started, and how the report will be delivered to their address after completion, the rest schedule, etc [7].

Conclusion. Improving the efficiency of passenger transport and saving resources in transport is one of the main problems of enterprises. For this, regularly monitoring the flow of passengers and counting their number is one of the most important tasks. Continuous study of passenger flow is carried out no more than once a year. Sample studies are conducted depending on the need - when there are not enough vehicles on certain routes or when their number is excessive on certain routes. Studies show that sampling 25-28% of trams, 24-26% of trolleybuses and 45-50% of buses provides sufficient accuracy for statistical calculations [8]. The use of an automated calculation system in the study of the flow of passengers is effective in determining the number of rolling stock on the routes and correctly choosing their movement intervals. The more vehicles there are on the route and the shorter the distance between them, the better the quality of passenger transport service.

Passenger count issues are relevant not only for urban public transport, but also for suburban trains and subways. Automated accounting systems help to improve the services provided not only in the transport itself, but also in airports, railway stations, etc.

References:

1. Azimov, S., & Shirinboyev, M. (2022). DEVELOPMENT OF TECHNOLOGY FOR CREATING POLYMERIC COMPOSITE MATERIALS BASED ON POLYVINYLIDENFTORIDE AND DISPERSED FILLERS. *Евразийский журнал академических исследований*, 2(13), 828-835.
2. Abduqayumovna, K. M., & Qayumjon o'g'li, A. S. (2022). MEN SEVGAN YETUK OLIMLAR. *Journal of new century innovations*, 19(5), 125-129.
3. Gulomov, J., Azimov, S., Madaminova, I., Aslonov, H., & Dehqonboyev, O. (2020). IV CHARACTERISTICS OF SEMICONDUCTOR DIODE. *Студенческий вестник*, (16-9), 77-80.
4. Behzod, B., Suhrob, A., & Sarvar, A. (2019). DIFFERENTIAL LEARNING IN PHYSICS. *European Journal of Research and Reflection in Educational Sciences Vol*, 7(12).
5. Qayumjon o'g'li, A. S., & Sulaymonovich, T. S. (2022). DEVELOPMENT OF A MACHINE FOR CUTTING COTTON. *Новости образования: исследование в XXI веке*, 1(5), 192-198.
6. Azimov Sarvarbek Qayumjon ugli, Yusupov Bunyodbek Abdugarim ugli, & Madina Zarbotova Qaxromon qizi. (2023). Important Aspects in the Application of Composite Materials and New Methods of Application. *Texas Journal of Engineering and Technology*, 16, 11-14.



7. Jo'rayevich, Z. S. ., Ahunov Rustam Yusupovich, & ugli, A. S. Q. . (2023). Concept of Road Traffic Safety and Its Solutions and Analysis. *Pioneer : Journal of Advanced Research and Scientific Progress*, 2(11), 25–27. Retrieved from <https://innosci.org/jarsp/article/view/1915>