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METHODS FOR CALCULATING THE PARAMETERS OF PASSENGER FLOWS IN URBAN PUBLIC TRANSPORT

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Abstract:

This article describes the problems of urban public transport, including passenger transportation, passenger transport services. The main focus is on the assessment and forecasting of the process of providing transport services to the flow of passengers in the urban transport infrastructure, the methods of calculating the parameters of passenger flow are analyzed.

Keywords: *Passenger, public transport, service, passenger flow, ratio, rush hour, haul, infrastructure*

INTRODUCTION.

Today, the problems of urban public transport remain one of the most important in the complex development of cities and their functioning at the level of demand. Problems such as the increase in urban transport, population growth, congestion on city streets and roads have a significant impact on passenger traffic on bus routes in Tashkent.

One of the most pressing issues today is the delay in getting passengers to their destinations on city buses. The provision of transport services to the flow of passengers, the assessment and forecasting of these processes is an important issue in the development of urban transport infrastructure. In solving this problem, it is important to carry out targeted scientific research on the provision of transport services to the flow of passengers, their full and selective inspection, the definition of critical parameters of the capacity of regime-changing facilities. At the same time, it is necessary to predict the parameters of passenger flow in order to determine the probability of delay of public passenger transport, to make rapid changes in its work schedule.

Many factors such as the study of urban public transport parameters, ensuring their compatibility, the effective organization of these processes should be taken into account when assessing and forecasting the process of providing passenger services in the urban transport infrastructure. Each of them requires a separate approach and a complex solution.

In order to ensure the implementation of this practical work, the Resolution of the President of the Republic of Uzbekistan dated March 6, 2019 No PP-4230 "On measures to radically improve the system of freight and passenger transportation" was adopted [1]. According to the resolution, it is necessary to assess the process of providing transport services to the flow of passengers, to make appropriate adjustments to the schedules of urban public transport, taking into account changes in the parameters of passenger flow and ensure their compatibility.

MATERIALS AND METHODS OF RESEARCH.

The world's leading researchers, including S.Hernandez, C.Morton, A.Bristow from the USA, R.Z.Farahani from Europe, Haojie Lee from Asia, D.A.Hensher, E.Miandoabchi, W.Y.Szeto, H.Rashidi, A.P.Anisimov, S.P.Artemev, M.E.Antoshvili, S.N.Balatsky, M.D.Blatnov, A.M.Bolshakov, and others from Russia conducted research.

The above-mentioned scientists have conducted research on the organization of urban passenger transport, modeling of public passenger transport, improving the quality of passenger transport services. All research has studied passenger flows as a key indicator of the organization of urban passenger transport and aims to find scientific solutions to such problems as the analysis of passenger flow control, improvement of methods of its implementation, mechanisms for applying the results of passenger flow control in practice.

Development of advanced models of urban transport systems by world scientists, development of advanced transport technologies using automated systems to control passenger flows, distribution of passenger demand by

routes, solving problems related to passenger transport technologies in the route network, scientifically based urban transport networks Research is being carried out in the field of design and identification of expected passenger flows [2].

RESULTS OF RESEARCH.

Urban and suburban public transport plays an important socio-economic role in the process of involving the population in the production process and helping to meet their cultural and social needs. It is known that in order to take into account changes in the volume and composition of traffic of different categories of passengers, a comprehensive inspection of passenger traffic in urban and suburban transport is scheduled at least once every 5 years on public transport routes in cities and urban-type settlements [3].

When checking the flow of passengers on urban and suburban public transport routes, it will be necessary to use the current classification of passengers by categories and groups according to their individual characteristics. For statistical verification of passenger flow, it is advisable to choose a period in which their coefficient of non-uniformity is equal to or close to 1.0. The coefficient of unevenness of passenger flows by seasons K_c- is determined by providing a relationship between the annual volume of passenger traffic Q_й and the monthly volume of traffic Q_j.

$$К_с=\frac{Q_j Д_к}{Q_й Д_j};$$

where Д_к , Д_j are the calendar days of the year and j-month;

Coefficient of unevenness of passenger flows by weeks of the month [4].

$$К_м=Q_n^m *Д_j/Q_j*Д_х$$

where Q_n^m-m is the volume of passengers carried during the week; passenger; Д_x-days of the week.

Coefficient of unevenness of passenger flows on weekdays [5].

$$К_д=\frac{Q_{сут}^n Д_х}{Q_н^m};$$

where Q_сут^n is the volume of passengers carried on the i-th day of the week, passenger

Coefficient of unevenness of passenger flows per hour [6].

$$К_ч=\frac{Q_{пик} T_м}{Q_{сут}^n};$$

where Q_пик is the volume of passengers transported during the "busy" time, the passenger; Qi - working time in the direction during the day, hours.

Coefficient of uneven flow of passengers on routes in "tight" times.

$$К_н=2Q_{max}/Q_{пик},$$

where Q_max is the maximum level of passenger flow in the direction of the volume of passengers transported in the direction of "tight" times, the passenger.

The route length KL (in one direction) of a city public transport moving in one direction is changed to ensure that the Qmax passenger flow is equal to its max Nn power at maximum load on the haul, i.e. [7].

$$К'_L=\frac{nN_n^{max}}{\sum_1^n N_n};$$

This, in turn, leads to incorrect results of N_n^max even under conditions where the lengths of hauls in the direction are equal [8].

$$K_L=K'_L/К'_{см}$$

where n is the number of hauls in the direction of maximum passenger flow;$\sum_1^n N_n$, - total loads of hauls on the route with maximum passenger flows;$К'_{см}=L_м/l'$- coefficient of passenger turnover in the directions with maximum passenger flows during "tight" times; Lм -length of the route, km; l′- is the average travel length of passengers on routes with maximum passenger flows during peak hours.

CONCLUSIONS:

Using the given formulas, it is possible to assess the level of transport services to the population in the routes of cities by determining the parameters of passenger flows

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