GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 10, Issue 12, Dec. (2022)

RESEARCH OF PASSENGER TRAFFIC IN PUBLIC TRANSPORT OF THE CITY OF URGENCH

Omarov J. A.
Tashkent State Transport University Tashkent, Uzbekistan

ABSTRACT

As a result of the acceleration of the urbanization process, the increase in megacities, population growth, the demand and need for public transport are increasing every year. This, in turn, leads to the need to improve the efficiency of public transport, adapt to today's times and conditions. This determines the importance of increasing the efficiency of using the existing transport infrastructure through proper planning and modeling of urban public transport. The article describes the methodology for determining passenger traffic on existing public transport routes (using the example of the city of Urganch).

At the same time, the flow of passengers in urban public transport was carried out using modern information technologies by measuring at stops, in bus stations and inside public transport. As a result of the determination of passenger traffic on public transport, the districts of the city of Urganch that require improvement of transport infrastructure have been identified.

Keywords: public transport, passenger flow, bus stops, bus stations, transport, number of passengers, flight, bus routes, daily measurement.

INTRODUCTION

The rapid development of the economy and the increase in the standard of living of the population require development of the transport sector. In our Republic, exchange of material resources and the rapid growth of population mobility indicators lead to a daily increase in the demand for the use of transport services. At the same time, every newly built facility, new residential areas, manufacturing enterprises, trade, household services and social facilities create additional burdens on the urban public transport system [1].

As a result, poorly organized urban public transport systems cannot cope with large passenger flows. It is observed that the time spent by the population on the road increases, excessive fuel consumption and damage to the environment (due to traffic jams) increase the number of road traffic accidents

Today in our republic, 3 mln. about 200,000 motor vehicles are registered, increasing by 6-7% per year on average. This increases the importance of activities such as improving the quality of services in public transport, solving transport problems in big cities, fundamentally revising and expanding passenger transport routes taking into account the needs and preferences of the population, managing the activity of taxis without directions, and building the infrastructure of the bicycle transport system.

In this regard, a number of systematically relevant issues were determined at the extended video selector meeting "On measures to further develop public transport in Tashkent city and regions" under the leadership of the President of the Republic of Uzbekistan on November 30, 2020. In particular, taking into account the current and next 10-year needs for transport

services, a clearly targeted measure for the strategic development of the transport system is the development of transport master plans of large and medium-sized cities.
Implementation of the above tasks requires research of the current state of the city transport system.

The purpose of the research: to develop a method of studying the flow of passengers in city public transport.

Tasks of the research: development of the procedure for proper organization and defining the categories of measuring flow of passengers in city public transport; development of the procedure for analyzing the measurement results.
Transport problems are mainly solved by a deterministic approach and a physical analogy method based on a systematic approach, with extensive use of extimolar theory and mathematical statistics methods [2-4].
Many scientists have carried out studies on passenger flow determination, analysis, evaluation and forecasting of passenger flow indicators in urban public transport [5-8]. Based on the analysis, it was shown that the possibilities of modern information technologies are not fully involved in the process of determining the flow of passengers in the process of modeling the public transport of the city, and it is necessary to take into account the characteristics of the territory in the process of determining the flow of passengers [9-11].
Passenger flow measurement in city public transport is carried out in 3 different types of objects:
1. At the crossroads;
2. At the bus stop;
3. In the direction of public transport.

Measurement of the flow of passengers in the city public transport is carried out with the help of counters. It is necessary to provide the enumerators involved in measuring the flow of passengers in public transport with the necessary equipment and materials.
The monitoring results are recorded based on the classification of buses presented in Table 1.

Table 1. Bus types

№	Bus types	Size, (m)
1	Very little	Till 5
2	Little	6-7,5
3	Middle	8-9,5
4	Big	10,5-12
5	Very big	Above 16,5

Types of measurement:
1 – At the crossroads.
Measurements to determine the intensity of public transport passing through the intersection are carried out from Monday to Thursday from 7:00 to 19:00. The start and end times are clearly written. Exchange times of counters at the metering point may vary depending on their working hours. Measurements should be stopped if there is a problem with the movement of city public transport. In order to save time and costs, measurements at road intersections can be combined

with measurements at stations or with daily measurements of private vehicles. In this case, all the requirements for measurement must be met.

2

– At the bus stop.

Measurements at bus stops are carried out at bus stops and bus stations once a week from Monday to Thursday from 7:00 to 19:00, and also on weekends (Saturday, Sunday) from 7:00 to 18:00. At bus stops, measurements are made on both sides of the street. Measurements at junctions are made on one side of the street. Measurements should be stopped if there are any points that could affect the movement of city public transport.

3 – In the direction of public transport.

Measurements in the direction of public transport are carried out from Monday to Thursday from 7:00 to 19:00. Measurements in public transport are recorded separately in the forward and reverse directions of the same flight.

Based on the criteria mentioned above, measurements were made at 12 intersections, 6 bus stops and 14 intra-city buses within the framework of the study of the city of Urganch.

Figure 1 shows the address location scheme of passenger flow measurement points in public transport.

Figure-1. Address location scheme of passenger flow measurement points in public transport

Enumerators standing at 12 points at road intersections visually observed public vehicles passing through the intersection, evaluated the time of passing through the intersection, the degree of occupancy of public transportation in a point system and took pictures. Enumerators at bus stops recorded the time of arrival of buses at the stop, the level of occupancy, and the number of passengers who got on and off the bus.

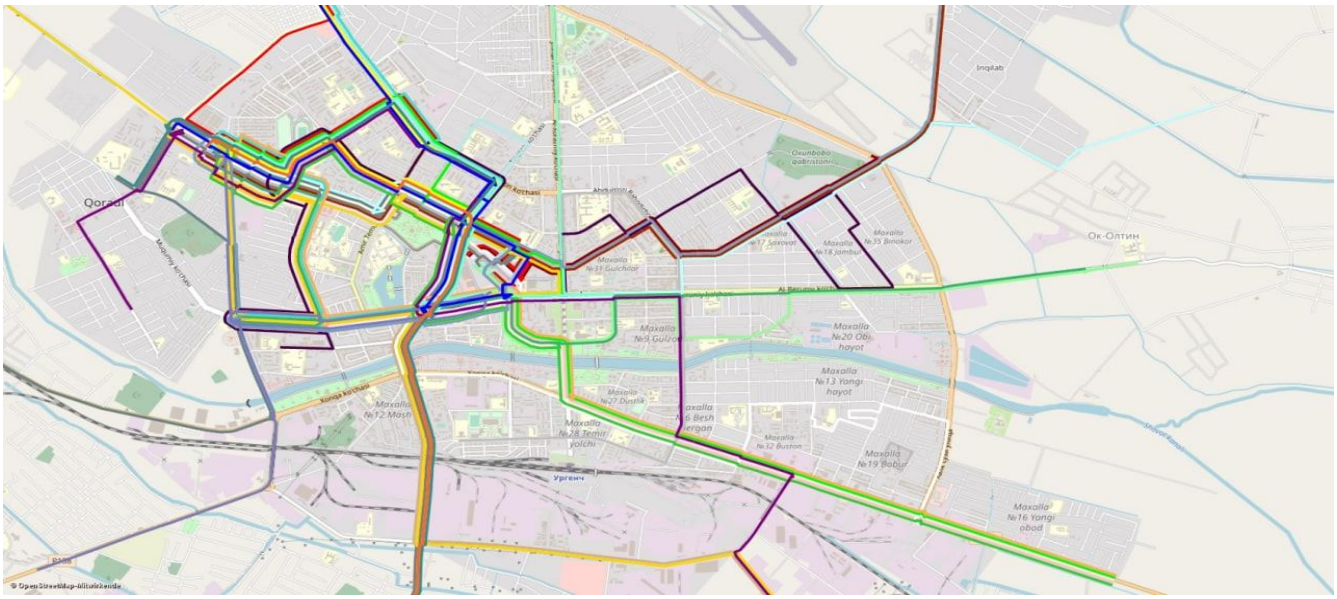

Figure 2. Urgan city public transport route scheme

The flow of passengers on public transport routes was carried out on the public transport routes of Urganch city presented in Figure 2. The flow of passengers on public transport routes in the city of Urganch was recorded by enumerators in the PASSIM program. The PASSIM program records changes in the speed of the bus moving in the direction, the number of passengers in the bus cabin and the number of passengers transported in one trip. The change in the speed of the bus in the PASSIM program is shown in Figure 3.

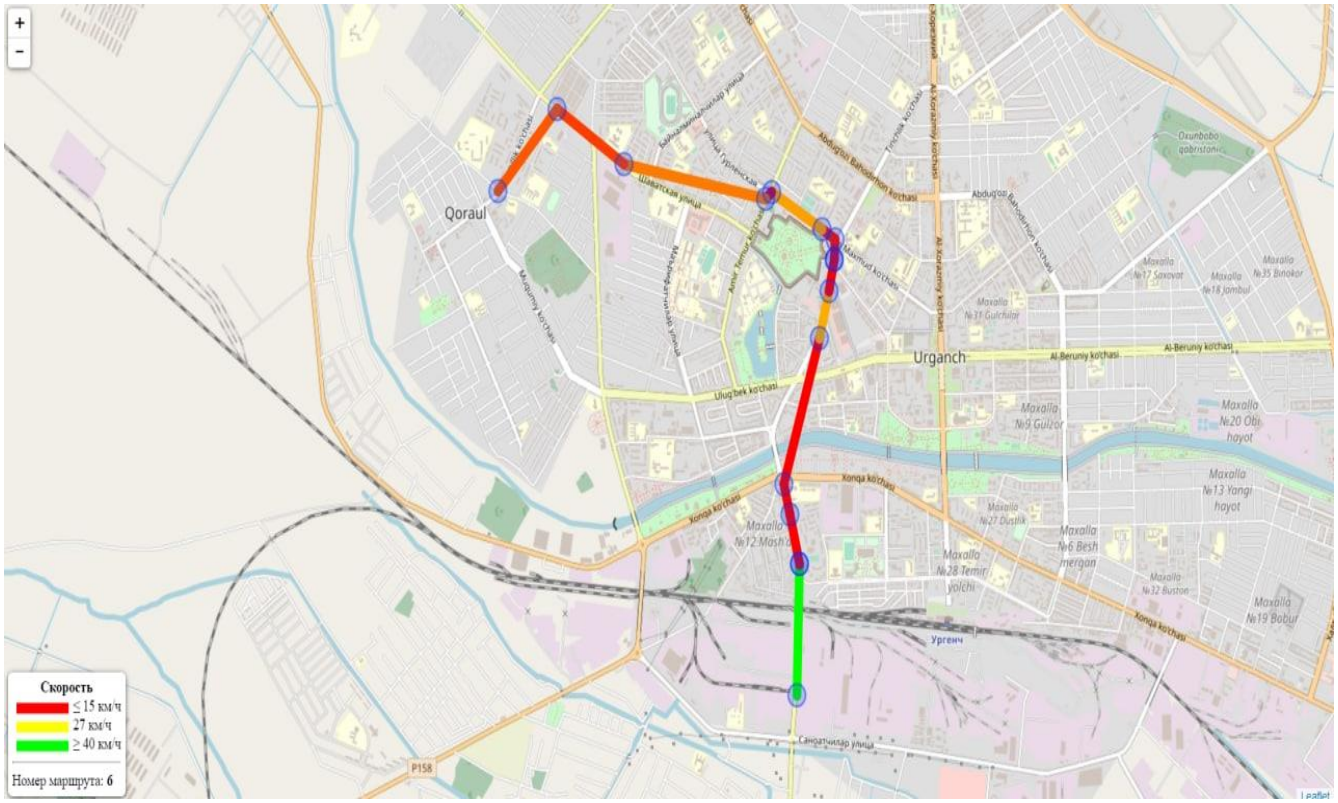

Figure 3. Measuring the speed of the bus on route 6

The number of passengers transported in one trip on the bus running on the 6th route in the city was recorded in the PASSIM program and is presented in Figure 4.

Figure 4. Passenger flow on route 6.

Data collected by enumerators on public transport routes in Urganch city were analyzed and calculated. The average speed of city public transport is calculated from the formula (1).

$$V_{avarage} = \sum_{1}^{n} V_{avarage}^{direct} / n_{direct} \quad (1)$$

Here: $V_{avarage}^{direct}$ - average speed in the direction

n_{direct} – number of directions

The average speed in the direction is calculated in the formula (2)..

$$V_{avrg.}^{dirc.} = \frac{\sum_{1}^{n} V_{avrg}^{travel}}{n_{travel}} \quad (2)$$

Here: V_{avrg}^{travel}- average speed in travel

n_{travel}- number of travels

Average speed of travel is calculated by formula (3).

$$V_{avrg}^{travel} = \frac{l_M}{t_x + t_o} \quad (3)$$

Here: l_M – route length

t_x – time in motion

t_o – stop times

The average speed of public transport in the city of Urganch was calculated by calculating the average speed of public transport routes. Figure 5 shows the average speed of routes and the average speed of public transport in the city of Urganch.

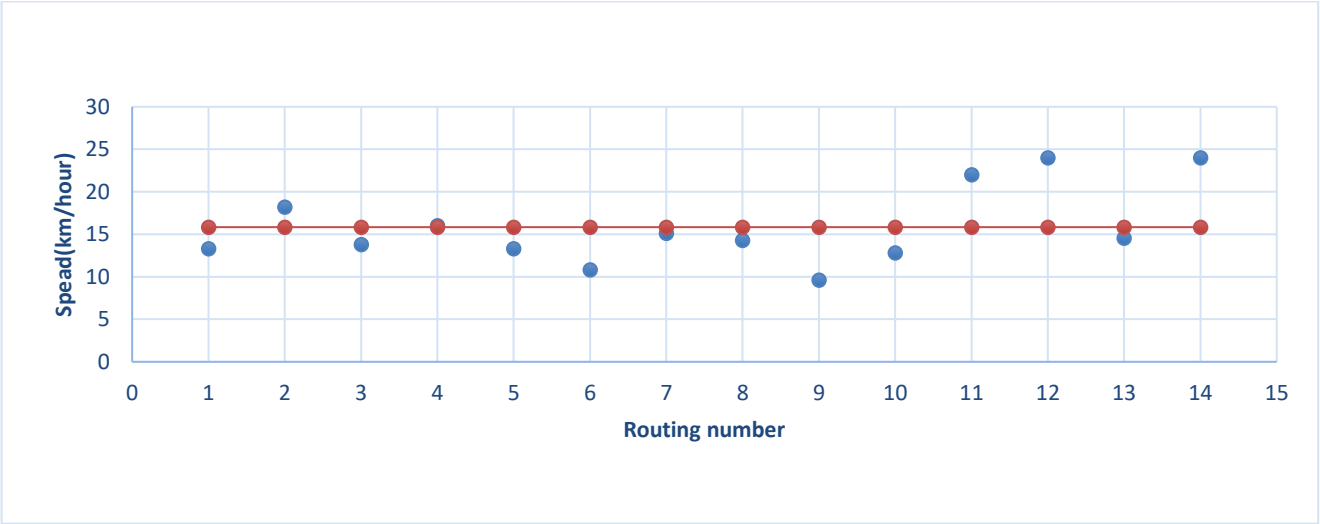

Figure 5. Average speed of public transport in Urganch city

The number of passengers transported daily on the public transport routes of Urganch city was calculated. The total number of transported passengers was calculated as follows (4).

$$Q_{avrg} = \sum_1^i Q_{trevel} \quad (4)$$

The total number of transported passengers on the route was calculated in the formula (5).

$$Q_{trevel} = \sum_1^i Q_{flig} \quad (5)$$

Q_{flig} - the number of passengers carried in one journey.

Figure 6 shows the calculation of the number of transported passengers in the cross-section of routes.

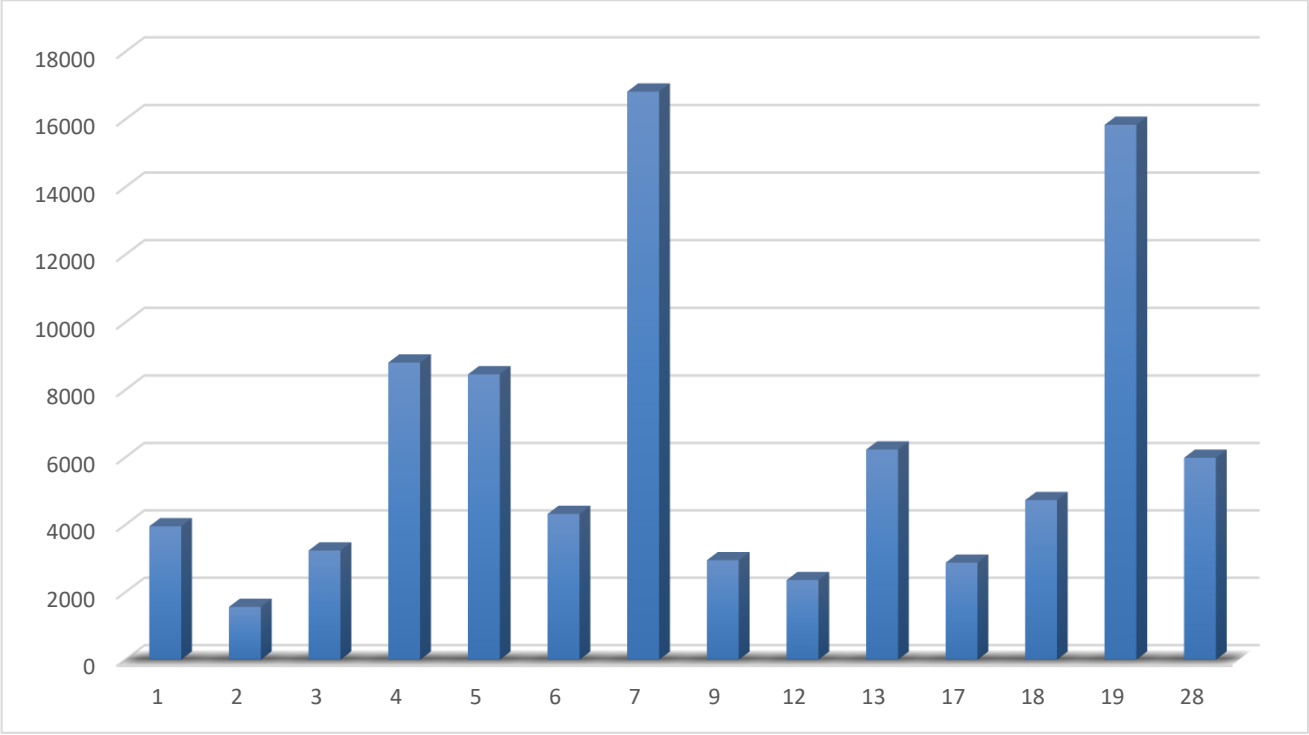

Figure 6. The number of transported passengers on the section of routes

At bus stops and intersections, enumerators visually count the flow of passengers in public transport and record the number of passengers on a record sheet. The recorded data was

analyzed and the level of public transport in Urganch city was evaluated in a 5-point system during the day in Figure 7.

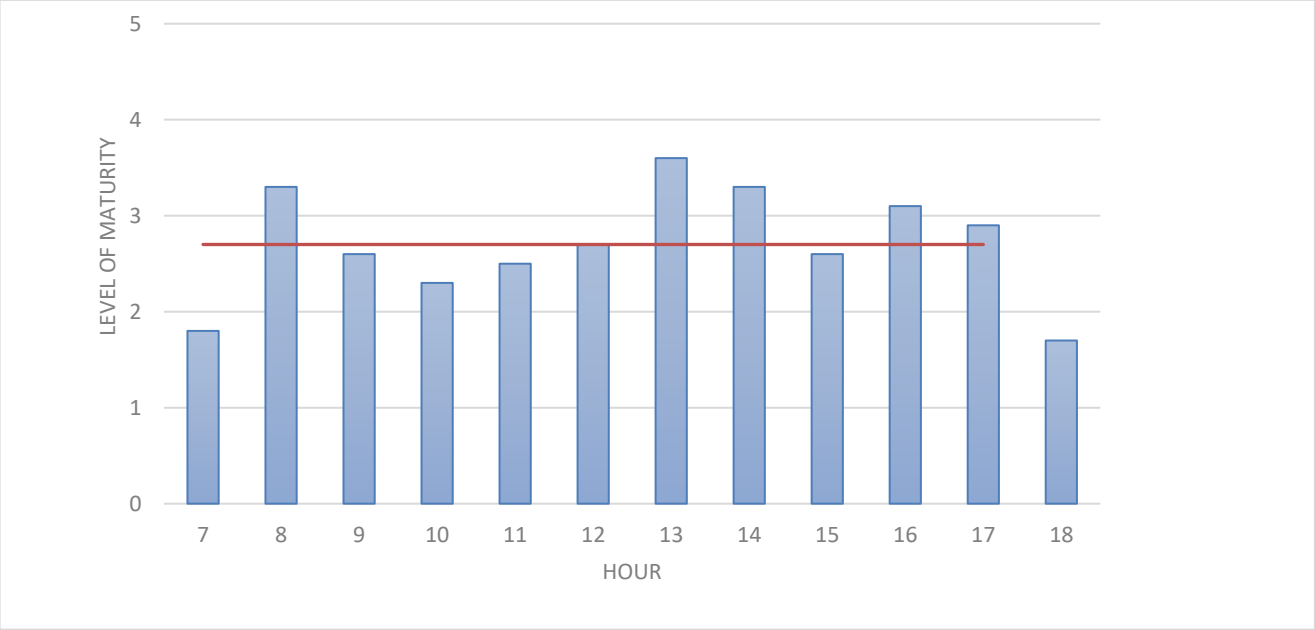

Figure 7. Bus occupancy level

The daily number of passengers carried by Urganch city public transport was calculated by the hours of the day. Figure 8.

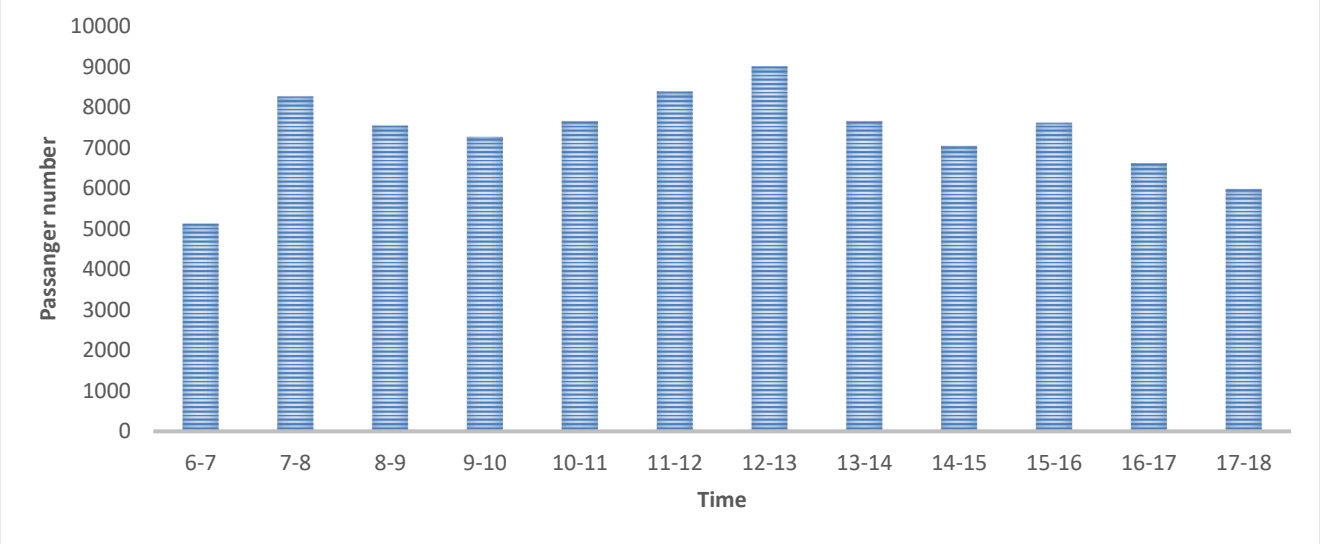

Figure 8. Changes in the number of passengers during the hours of the day

Through the method of studying the flow of passengers in public transport, the flow of passengers in public transport of the city of Urganch was determined. According to the results of the research, the average speed of public transport in the Urganch agglomeration was 15.84 km/h. According to the results of the calculation, the least 1563 people were transported on the 2nd bus route, and the most 16822 people were transported on the 7th route. According to the analysis of the hours of the day in public transport, it was found that the flow of passengers increases between 7:00 and 9:00, 11:00 and 13:00 and 15:00 and 16:00. A total of 88,121 passengers were transported on 14 public transport routes in the city of Urganch.

REFERENCE

1. Abdurazzokov U., Sattivaldiev B., Khikmatov R., Ziyaeva Sh., [2021], Method for assessing the energy efficiency of a vehicle taking into account the load under operating conditions,CONMECHYDRO – 2021,E3S Web of Conferences 264, 05033, https://doi.org/10.1051/e3sconf/202126405033
2. Ziyaev K., Development of a test complex for determining the modes of movement of vehicles, Scientific-technical journal of FerPI(2021)
3. Kulmukhamedov Zh., Khikmatov R., Saidumarov A., Kulmukhamedova Y. [2021]. Training neural networks using reinforcement learning to reactive path planning. Journal ofApplied Engineering Science, 19(1) 68 - 76. DOI:10.5937/jaes0-27851;
4. Mukhitdinov A., Ziyaev K., Omarov J., Ismoilova Sh., [2021], Methodology of constructing driving cycles by the synthesis, CONMECHYDRO – 2021, E3S Web of Conferences 264, 01033,https://doi.org/10.1051/e3sconf/202126401033
5. Mukhitdinov A., Kutlimuratov K., Assessing the operational impacts of road intersection using ptv vissim microscopic simulation. International Journal of Advanced Research in Science, Engineering and Technology, (2021), 18682-18690, 8(12)
6. Ichiro K., [2016], Addressing Energy Efficiency in the Transport Sector Through Traffic Improvement. ERIA Research Project Report 2016, No.04. https://think-asia.org/bitstream/handle/11540/7439/RPR_FY2016_04.pdf.sequence1
7. Mukhitdinov A., Kutlimuratov K., Khakimov Sh., Samatov R., Modelling traffic flow emissions at signalized intersection with PTV Vissim, E3S Web of Conferences, (2021), DOI:10.1051/e3sconf/202126402051
8. A. R. Mahayadin et al., "Efficient methodology of route selection for driving cycle development," in Journal of Physics: Conference Series, 2017.
9. Mukhitdinov A., Kutlimuratov K.,Impact of stops for bus delays on routes, IOP Conference Series: Earth and Environmental Science, (2020), ISSN 1755-1315, DOI: 10.1088/1755-1315/614/1/012084
10. Ziyayev K.Z., Ismailova Sh.B., Method of determination of transport intensity in urban conditions, European multidisciplinary journal of modern science (2022), volume 5
11. Ziyaev K., The Appeal is at the Center of Youth Issues, Academic Journal of Digital Economics and Stability (2021).