Volume 3, Issue 1, January 2025 **ISSN (E):** 2938-3757

DEVELOPING WAYS TO INCREASE THE EFFICIENCY OF URBAN PASSENGER TRANSPORT MANAGEMENT

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Abstract
This article is about the use of modern electronic systems in the provision of transport services to the population of the city and the convenience of the population. Improving the efficiency of urban passenger transport management is a topical issue today. Therefore, the organization of proper traffic and improving traffic safety is a solution to the current problem.

Keywords: City transport, modeling, passenger, transport, logistics, dispatcher, mathematical model, mobile point, optimization, city public passenger transport, automatic management system.

Introduction

After the independence of the Republic of Uzbekistan, economic changes began to be introduced consistently. For example, the automobile manufacturing industry was launched, the road construction sector was accelerated, and trade relations with foreign countries were raised to a high level [1-3]. Organization of traffic safety on highways is becoming one of the most important problems today. Urban passenger transport from the point of view of dispatching management belongs to the class of spatially distributed objects, the use of which is limited to the research of usual modeling and optimization mathematical methods [4-7].

All this requires scientifically-based methodology and modern mathematical equipment within the framework of integrated information computer system with active addition of service components. Service components ensure the interaction of vehicles in making control decisions in the dispatch control system [8-11].

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Materials and methods

Local and foreign experiences have shown that the actual problems of increasing the efficient operation of transport in large cities should be automated and optimized planning processes using mathematical models and computer modeling.

This problem is complicated by the multi-functionality of the transport system, the decentralization of planning and management, the dynamic and probabilistic character of the studied processes, the activity of the management object, which requires taking into account many psychological and socio-economic factors.

In the context of the introduction of an automated control system, modeling can be one of the methods of comparing alternatives and choosing the control effect on the system in the case of limiting the normal state. Management of selected systems is carried out in bulk. Work sequence is considered and listed on a schedule basis.

As a result of the non-participation and narrowness of the research, there is still no unified classification of sheep according to the following signs:

– the degree of importance and urgency of solving the relevant issues;

– the absence of a single methodological point of view even when there is a type of task, on the basis of which it is possible to generalize various studies;

– the use of different performance evaluation criteria in the management of the same processes, which makes it difficult to compare the results;

– makes the developed model inconsistent with its data.

The peculiarity of the urgency of the considered problem lies in the fact that the organization of management of the operation of the transport system independently of the research of various directions, ensuring the safety of traffic, cargo and passenger transport planning, road design and transport urbanism specialists are involved [12-17]. This leads to the establishment of a number of independent transport disciplines and transport network directions, which can operate until the various systems perform their tasks independently. Thus, in order to find a solution to any task of planning and automating transport processes, it is necessary to apply interrelated factors that determine the nature of the entire transport system [18-24].

There are also technological variations and returns to theoretical development of experiments. In most cases, the newly designed and implemented automated control system in urban passenger transport works without sufficient justification:

1). Select system content;

2). Request for information;

3). Technical and programming requirements.

In the context of the implementation of an automated control system, modeling can be one of the methods of comparing alternatives and choosing the control effect on the system, limited to the normal state. One of the important conditions for improving the quality of meeting the demand for transportation of the population of large cities and improving the economic performance of urban public passenger transport is to increase the efficiency of rapid traffic dispatching management. This will enable the city's public passenger transport network to fully utilize its potential to provide a full range of transport services to the city's residents [25-29].

Increasing the level of automation and increasing the effectiveness of the rapid dispatching control of urban public transport traffic based on the introduction of new information

technologies will ensure the development and implementation of an automated control system and the control of urban passenger transport traffic. Creating an automatic transport control system (ABT) is not a simple task of an automated control system of a suitable subsystem of the transport complex. In addition, it is of great importance to use modern sputnik systems in transport, including technologies for managing objects in motion, and other new progressive (progressive) systems, which are used in various transport routes of large foreign cities, for example, RTI, IVHS - the movement of motor vehicles includes other advanced technologies for controlling moving objects that are actively used in control technologies.

In the countries of the Commonwealth of Independent States (CIS), the Collective Security Treaty (CSTO) and the Eurasian Economic Union (EAEU), such information technologies are of urgent importance. Their application is based on the principles of automating transport management of large cities and regions, creating automated systems for managing transport enterprises, providing transport services to the population, based on the principles of transport logistics, service logistics and automation of logistics systems [29-31].

The dynamics and constant changes of transport infrastructure development of large cities do not allow to use ready-made, tested solutions in other cities for the design of automated operational control systems. According to previous studies, the analysis of the multi-criteria approach, the concept of evaluation of the traditional methodology of control automation in motor vehicles shows that radical new changes are needed in the application of advanced technologies to control various moving units of urban public passenger transport. allows to emphasize. It meets the requirements of improving the provision of transport services to the population of large and large cities, spreading information, intelligent, satellite management technologies in transport systems. In this regard, the basis of the methodology of designing these systems is the principles of intellectualization of subsystems and connections of the transport complex in accordance with the general practice of computerization. Mathematical modeling, algorithmic and software are recommended for the further development of the functional tasks of the rapid transport management system. In our opinion, the construction of such a system should begin with the creation of mobile communication points to monitor the movement of urban public passenger transport [31-34].

Such points can perform all the functions of monitoring the condition of moving units, passengers, routes in general. They are unique mobile units equipped with the necessary equipment to perform the functions of monitoring the condition of vehicles and communications and collecting data on individual routes.

The mobile station is located on the highway, its composition can change depending on specific tasks and operating conditions, and it is equipped with the necessary equipment. One of the important areas of application of the mobile point is the preparation of output data to optimize the city's route network and vehicle traffic schedule.

The overview of the simulation model of ASU urban public passenger transportation work can be expressed in several levels: each level of such a system should have its own simulation model. In this case, the input to the model can be the output from another model at any level, implying feedback. Since the route is the main link of the transportation system is the route composed of vehicles, Figure 1 is an overview of the ASU urban public passenger transportation simulation model. In general, the operation of the transport system can combine the first and second levels,

which describe the operation of the route.

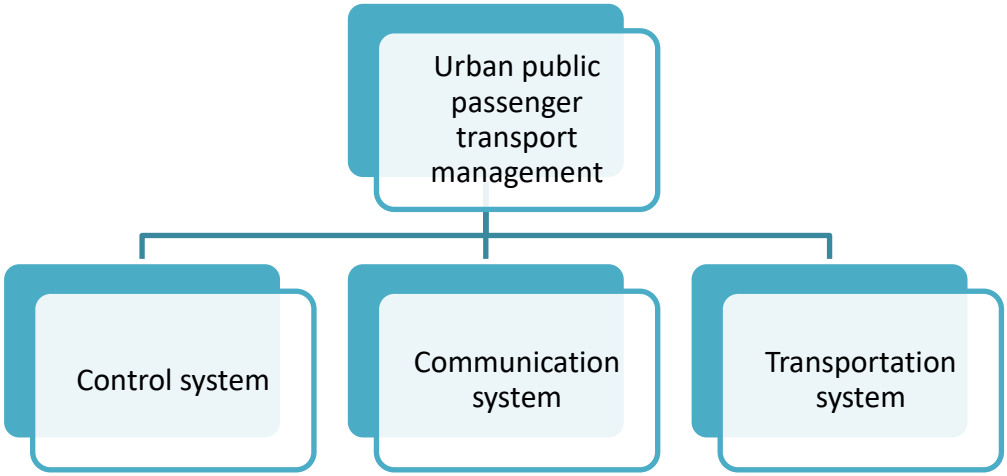

Figure 1. City public passenger transport management structure

As input parameters in the route model, the serial number of the vehicles operating on the route, the schedule of vehicle operation, the traffic schedule on the route, the possible passenger flow, as well as the possible state of transport communications on the route. In the process of work, the car is a carrier of the following information:

1. technical condition of the vehicle;
2. its location;
3. speed;
4. stop time at stops;
5. filling the car cabin with passengers.

This information provides complete information about the traffic mode, possible causes of deviations, the possibility of correcting the operation of the vehicle, based on which the operation of the route can correct the traffic schedule of the vehicles in the real operating conditions of the urban public passenger transport.

The next level is the entire transport system. System management is performed at the dispatch center level. Models at this level should take into account the possibilities of coordination of the work of different routes, analysis of algorithms for the distribution of vehicles along routes, transfer of vehicles from route to route, efficient use of reserves, general dynamics of passenger transport distribution, general analysis of transport quality and the overall transport system. activity. These models can be used as algorithmic support for automated management and control systems of city public passenger transport.

In these models, as a mathematical device, it is necessary to use a set of smart technologies that have proven themselves well when used in automated systems. The development of a unified automated system of dispatching management of urban passenger transport services in accordance with the theory is the design of the organizational structure of urban passenger transport management, in which three subsystems are distinguished:

It is necessary to solve specific problems for each subsystem and general problems for the whole system, which ensure the normal operation of the system. Traffic and information flows emerge

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and form between these subsystems. In relation to the organization (city public passenger transport), this means that the management system must adequately respond to various situations related to the operation of the transport service system of the city population and the interaction of all subsystems.

It is necessary to solve specific problems for each subsystem and common problems for the whole system, which ensures the normal operation of the system. Traffic and information flows emerge and form between these subsystems. In relation to the organization (city public passenger transport), this means that the management system must adequately respond to various situations related to the operation of the transport service system of the city population and the interaction of all subsystems. For this purpose, a situational model of providing transport services to city residents was developed. Based on our proposed algorithm, it is a method that allows not to specify the passenger capacity of buses, their number and the distance of the routes separately, and it allows to rationalize a number of parameters at the same time:

This approach allows full consideration of the carrier's economic interests and allows the control system to choose the type and number of buses that provide the lowest cost for passenger transportation while meeting the standards of transport service quality.

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