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**TRENDS IN URBAN PUBLIC TRANSPORT**

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*The development of the urban public transport system in the world is carried out in such areas as strategic and operational management, the management of boarding and disembarking passengers, the planning and design of stopping points of the public transport route, the organization and planning of public transport on the route, the operational regulation of public transport based on traffic signals, and the organization of indirect measures to support public transport.*

*Many municipalities are conducting research aimed at identifying reserves for improvements in public transport systems and developing measures to improve route speed and efficiency. Having analysed the experience of developed countries, we can talk about the levels of development programmes, common problems and trends.*

***The purpose** is to determine the trends in the development of the urban public transport system, the direction of development.*

***Methodology** in article statistical methods of the analysis were used.*

***Results:** The functions of urban public transport management are considered. The level of implementation of urban transport development programs was systematized.*

***Practical implications** it is advisable to apply the results the economic subjects carrying passengers, direct management of urban transport systems, as well as to the municipality.*

**Keywords:** *urban transport; strategic management; development programs; passenger transportation.*

## ТЕНДЕНЦИИ РАЗВИТИЕ СИСТЕМЫ ГОРОДСКОГО ОБЩЕСТВЕННОГО ТРАНСПОРТА

**Рахматуллина А.Р., Коробейникова Е.В.**

*Развитие системы городского общественного транспорта в мире осуществляется по таким направлениям, как стратегическое и оперативное управление, управление посадкой и высадкой пассажиров, планирование и проектирование остановочных пунктов маршрута общественного транспорта, организация и планирование движения общественного транспорта на маршруте, оперативное регулирование движения общественного транспорта на основе сигналов светофоров, организация косвенных мероприятий по поддержке общественного транспорта.*

*Многие муниципалитеты проводят исследования, направленные на выявление резервов улучшений систем общественного транспорта и разработку мероприятий по повышению скорости обслуживания на маршрутах и эффективности. Проанализировав опыт развитых стран, можно говорить об уровнях программ развития, общих проблемах и тенденциях.*

**Цель** – определение тенденций развития системы городского общественного транспорта, направления развития.

**Метод или методология проведения работы:** в статье использовались статистические методы анализа.

**Результаты:** рассмотрены функции управления городским общественным транспортом. Проведена систематизация уровней реализации программ развития системы городского транспорта.

**Область применения результатов:** полученные результаты целесообразно применять экономическими субъектами, осуществляющими перевозку пассажиров, непосредственное управление

*городскими транспортными системами, а так же муниципальному управлению.*

**Ключевые слова:** *городской транспорт; стратегическое управление; программы развития; перевозка пассажиров.*

Strategic and operational management of services of urban public transport represents planning of strategy and operations which can be used for improvement of quality and efficiency of transport service. Planning of public transport is multilevel process which begins with policy of strategic decisions and comes to an end with development of detailed schedules of public transport on concrete routes. Process of planning depends on the specific transport operator in each type of public transport, a route of the movement and transport infrastructure [4].

The strategic planning of urban public transport includes the planning of its resource potential, the network of urban transport routes and virtually every traffic route of all types of public transport. So, planning of a route consists in definition of some most essential services connected with a priority of public transport and ensuring balance of many contradicting purposes for creation of a successful product. For example, introduction of an additional stopping point on a route of the movement of the bus does a route of public transport more attractive, but slows down its movement and increases operating costs. Two key moments are taken into account when planning process of transportation of passengers: speed of the movement of the vehicle on a route and reliability of the provided services of transportation [2].

Priority development programs of public transport can be implemented individually or as a part of the agreed programs. Many cities of the world used one of the following approaches in development of public transport: high-speed routes of public transport; city programs of priority development of public transport on all routes of its movement; priority programs of modernization of vehicles, road and transport infrastructure on concrete routes.

Program implementation levels. The author's studies of urban public transport programmes in developed countries have established five

different levels of implementation, ranging from limited application of individual improvements to the integrated use of their full spectrum throughout the public transport network. It should be emphasized that there are no strict rules for classifying these levels, which illustrate the activities of priority public transport programmes in different situations (see table).

*Table.*

**Levels of implementation of urban public transport programmes**

Realization level	Content of actions of development programs
Limited	Modernization of separate elements of vehicles, reforming of transport infrastructure and routes of transportation
On a separate route	Development of the general actions for improvement of transportations of passengers in segments of a route or along all route
In the certain territory	Introduction of improvements in a specific urban area
In the separate system	Introduction of All Types of Improvements in the Separate System of Public Transport
Complex	Introduction of complex improvements in all system of public transport

The complex level of implementation of public transport development programs has the following aspects: implementation of such priority improvements as, for example, allocated lanes for public transport and modernization of vehicles, optimization and coordination of the transport network and transportation management system, which contributes to a significant improvement in the quality of transportation and service, as well as their socio-economic efficiency [3].

Problems of implementation of urban public transport development programs. In many cities of the world, there are priority programmes for partial reform of the public transport system, but there are examples of neglect in solving such problems as the lack of central route management departments, the poor state of road transport infrastructure, and the unsustainable use of urban space. The implementation of many improvements is a problem for municipalities and transport operators. So, for example, most urban roads have a fixed amount of space available

for their diversion to public transport. These roads cannot be expanded to provide space for designated public transport lanes. In this regard, it is important to educate the public about the advantages of public transport as more efficient in modern urban conditions.

Strategic thinking and rational management of passenger traffic are ways to solve public transport problems on the basis of targeting and coordinating the activities of various departments with different goals. For example, the goal of many technical services of motor transport enterprises is to develop schedules of vehicles on the route, and the goal of municipalities is to reduce traffic jams on the roads. Both groups must learn to work together to achieve the common goal of the most rational and optimal use of street space. The problem of contradictory goals becomes even more acute when complemented by the goals of other interested organizations, for example, urban improvement services. Thus, there are the following problems in the implementation of urban public transport programs, which include difficulties in coordination between institutions and departments, pressure from users of personal vehicles, a poor understanding by the population of the benefits of public transport, resistance to changes by motor transport enterprises and the urban population.

Formation of operation centers of public transport. Operation centers perform public transport management functions such as monitoring of vehicle traffic on routes and feedback to the driver and passengers. Operation centres play an important role in assisting in the observance of public transport schedules and intervals. In case of violations of traffic schedules, center employees make decisions on a possible partial change in the route, speed and direction of transportation.

There are communication systems, information and instructions for drivers and passengers of public transport, such as vehicle tracking systems, information on the location of all vehicles in the system, registration and control of violations, spare vehicles for replacement on routes.

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The activity of operation centers is aimed at improving the quality of public transport services in real time and rational changes in its routing. This activity is most effective when the transport system is generally stable. Difficulties in improving transport services for passengers occur in cases of disruption of traffic schedules due to traffic jams on roads and incidents on routes. However, these difficulties can be overcome when traffic management is carried out on the logistics principles of coordination of activities, integration of management and optimization of routes.

The control of boarding and disembarking of public transport passengers is the preparatory and final technological operations for the inclusion of customers in the transportation process and their exclusion from it.

The management of boarding of passengers has a great influence on the efficiency of the transport system and the satisfaction of public transport customers. The biggest difference between the use of personal and public transport is that public transport cannot deliver a passenger to the destination, while private cars deliver a passenger without stopping from the point of departure to the destination. A key factor in increasing the attractiveness of public transport is reducing the time for passengers to board and disembark. The total amount of time spent boarding depends on the number of passengers and factors such as the existing fare system, the number of doors in the vehicle, the parameters of its cabin and the design of the interior. In addition, two additional factors, such as the number and convenience of stopping points, affect transport efficiency and customer satisfaction.

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