BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg

# ORGANIZATION AND OPTIMIZATION OF SUSTAINABLE URBAN TRANSPORT IN THE CITY OF SHAHRISABZ

**Karimov Akmal Akbarovich**
PhD in Technical Sciences
Associate Professor, Karshi State Technical University
Karshi, Uzbekistan

**Maxmudov Zuxriddin Nuriddinovch**
master's student in Transport Engineering
Karshi State Technical University, Karshi, Uzbekistan

**Abstract.** Ensuring the sustainable development of urban transport systems is one of the most pressing issues in the context of modern urbanization. Population growth, increasing motorization levels, and rising demand for transportation require efficient organization and management of urban transport systems. This study examines the current state of the transport system in the city of Shahrisabz and analyzes the key factors influencing its sustainable development. The research employs methods such as field observations of traffic flows, assessment of road and transport infrastructure, analysis of public transport operations, and identification of existing problems. The results indicate that the level of public transport network development in the city is insufficient, traffic flows are highly concentrated on certain routes, and infrastructure for pedestrian and bicycle movement is limited, all of which negatively affect the efficiency of the transport system. Based on the findings, scientific and practical recommendations are developed, focusing on optimizing public transport routes, introducing intelligent transport systems, modernizing transport infrastructure, and expanding the use of environmentally sustainable transport modes. The implementation of the proposed measures will enhance the efficiency of the Shahrisabz urban transport system, improve the quality of passenger services, and ensure environmental sustainability.

**Keywords:** sustainable urban transport, transport system, traffic flow, public transport, transport infrastructure, transport optimization, intelligent transport systems, urban mobility, green transport.

Transport systems are one of the key infrastructure elements ensuring the socio-economic development of any city. Daily mobility of the population, the functioning of production and service sectors, and the efficiency of interregional connections are directly linked to the level of transport system development. In recent years, the acceleration of urbanization processes worldwide has led to an increasing load on urban transport systems. This, in turn, has intensified attention to traffic flow management, improvement of public transport services, and ensuring environmental sustainability.

Scientific studies on urban transport development emphasize that the efficiency of transport systems depends not only on the condition of road infrastructure but also on the level of traffic flow management, the competitiveness of public transport, and the development of alternative transport modes. In particular, modern approaches consider the restriction of private car usage, increasing the

share of public transport, creating favorable conditions for pedestrian and bicycle movement, and implementing intelligent transport systems as key directions of sustainable transport policy.

Today, transport-related problems are not limited to large metropolitan cities but are also observed in medium and small cities. Population growth, the development of new residential areas, and the increasing number of commercial and service facilities have led to a continuous rise in transport demand. The failure of existing transport infrastructure to develop in line with this demand results in uneven distribution of traffic flows, congestion on certain routes, and a decline in the quality of transport services.

Shahrisabz city, one of the important historical and tourist centers of the Kashkadarya region, is also among the areas requiring improvement of its transport system. The spatial distribution of educational, healthcare, commercial, and service facilities significantly influences the formation of daily traffic flows in the city. In particular, high traffic intensity is observed in the central part of the city and on main entry and exit routes. At the same time, the insufficient development of the public transport system and the limited availability of transport services in some areas negatively affect population mobility.

The historical and tourism potential of Shahrisabz further increases the need for transport system development. The growing number of tourists, the expansion of the service sector, and the establishment of new economic facilities create additional pressure on transport infrastructure. Therefore, a comprehensive assessment of the current transport system and the development of scientifically based solutions for its sustainable development are of significant scientific and practical importance.

During the study, the current state of the Shahrisabz transport system was examined, traffic flows were observed, public transport operations were analyzed, and existing infrastructural problems were identified. Based on the obtained results, proposals aimed at improving the transport system and forming a sustainable urban transport system were developed.

The aim of this study is to assess the current state of the transport system in Shahrisabz, identify the characteristics of traffic flow formation, and develop scientifically grounded recommendations for the organization and optimization of a sustainable urban transport system.

BG Pulse Journal USA
ISSN:1947-2536 http://www.bgpulseusa.com/index.php/bg
BG PULSE JOURNAL

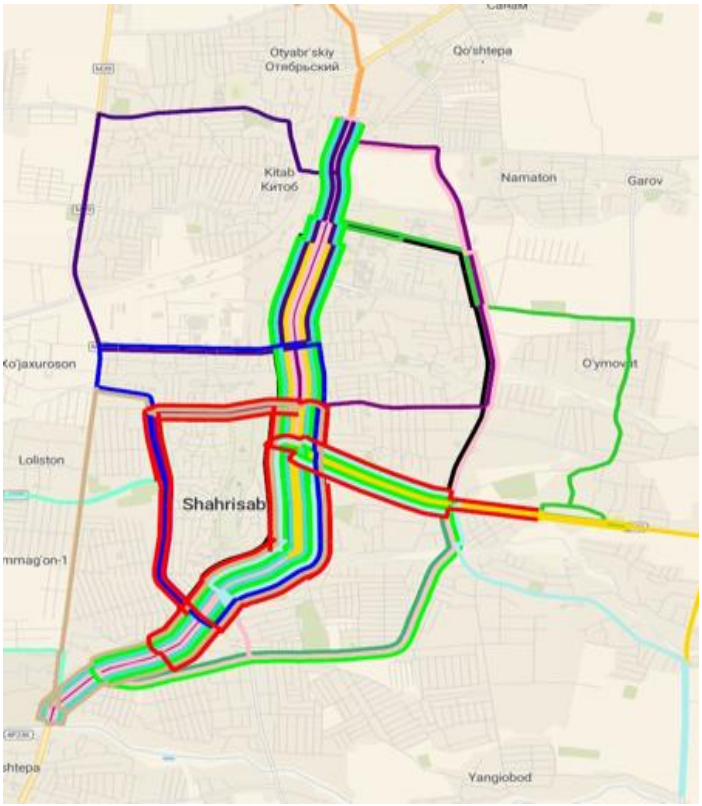



**Figure 1. Location of transport routes in Shahrisabz city.**

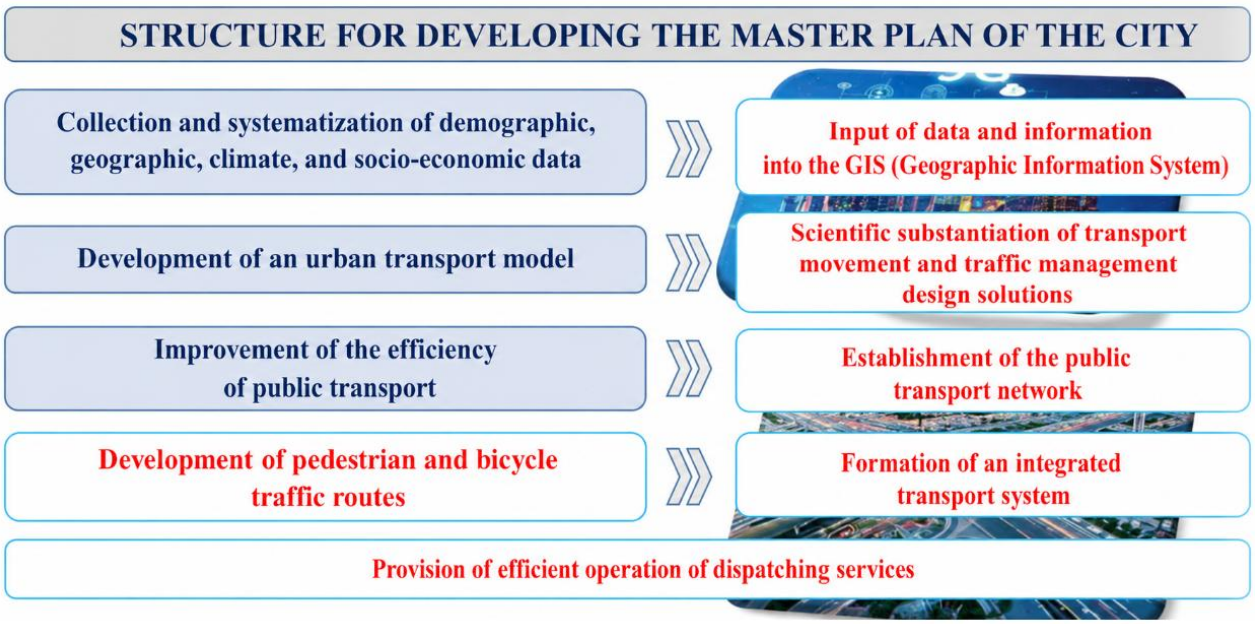



**Figure 2. Structure for developing the city master plan.**

Traffic flow intensity is one of the main indicators of traffic flow, representing the number of vehicles passing through a road section per unit of time. The process of studying it is carried out based on a general algorithm that includes defining the objective, selecting an observation point, collecting data, performing statistical processing, conducting time-based analysis, and finally building and validating a model.

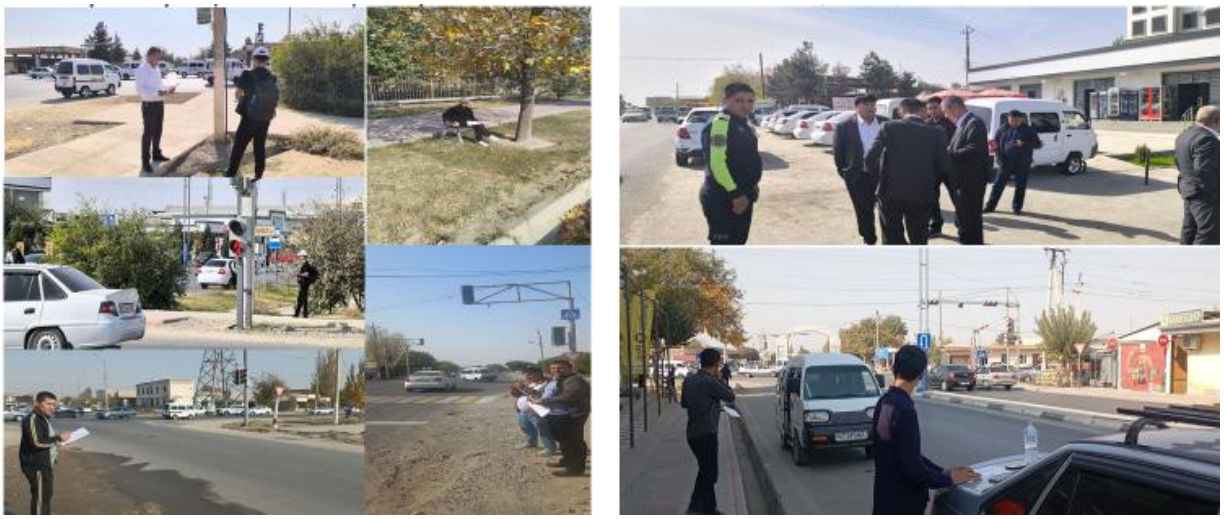


**Figure 3. General process of measuring traffic flow intensity**

Data is collected through sensors, video surveillance, or manual counting methods, and traffic flow intensity is determined accordingly. Based on the obtained results, the dynamic characteristics of the traffic flow are evaluated, and scientifically grounded conclusions are developed for optimizing transport infrastructure.

Studying passenger flow is of great importance in the planning and management of transport systems, as it helps assess the efficiency of public transport services. In this process, the intensity of passenger boarding and alighting, distribution across routes, and temporal variations are analyzed. Data is typically collected through ticketing systems, electronic cards, and survey-based observations. The obtained results are processed using statistical methods to determine passenger flow density and load levels. Based on the analysis results, scientifically justified conclusions are developed for organizing public transport routes, determining the number of trips, and improving service quality.

## LITERATURE

1. Akbarovich, K. A. (2025). O‘zbekiston shaharlari avtoturargoh infratuzilmasi: rejalashtirishdagi muammolar va yechimlar. Journal of innovations in scientific and educational research, 8(4), 158-163.
2. Каримов, А. А., & Кичкинаев, М. А. у.(2023). присадка для моторные масла. Educational Research in Universal Sciences, 2(3), 1021-1024.
3. Karimov, A. A. (2024). Organizing Management in the Transport Logistics System. American Journal of Engineering, Mechanics and Architecture, 2(6), 66-68.
4. Akbarovich, K. A., & Uroqovich, X. H. (2024). The Importance of Goods and Material Flows and Warehouses in the Development of Logistics. Excellencia: International Multi-disciplinary Journal of Education (2994-9521), 2(6), 564-568.
5. Karimov, A. A. (2023). Qarshi shahri ko ‘chalarida harakat xavfsizligini ilmiy asosda tadqiq qilish. Innovative Development in Educational Activities, 2(22), 190-199.
6. КАРИМОВ, А. А. (2017). Обоснования сроков службы моторных масел зарубежние автомобиля приусловия эксплуатации в Узбекистане. In Молодежь и системная модернизация страны (pp. 143-146).

7. Akmal Akbarovich, K., & Ergasheva, D. Z. I. (2024). Transport vositalarining tashqi telematik tizimlari va ularning ahamiyati. research and education, 3(11), 57-61.
8. Akbarovich, K. A. (2024). Motor moylarining avtomobil ekspluatatsiyasiga ta'siri. Илм-фан ва инновацион ривожланиш/Наука и инновационное развитие, 7(6), 82-91.
9. Karimov, A. A., Ergasheva, D. Z. I., & Ergashev, M. I. (2025). O'zbekistonda ertico loyihasi texnologiyalarini joriy etishning ilmiy asoslari va istiqbollari. Educational Research in Universal Sciences, 4(4), 39-43.
10. Akbarovich, K. A., & O'G'Li, A. D. S. (2025). Elektromobillarda qo'llanadigan litiy-ion akkumulyator batareyalarini muvozanatlash tizimlarini matematik modellashtirish va samaradorligini baholash. Илм-фан ва инновацион ривожланиш/Наука и инновационное развитие, 8(6), 98-112.
11. Akbarovich, K. A. (2026). Impact of road infrastructure on traffic safety in Kashkadarya region. Лучшие интеллектуальные исследования, 61(3), 389-397.
12. Akbarovich, K. A. (2026). Traffic safety enhancement using intelligent transport systems in Karshi city. Лучшие интеллектуальные исследования, 61(3), 398-407.