TRANSPORT-GEOGRAPHIC LOCATION OF BATUMI: CHALLENGES AND PERSPECTIVES OF USE

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Abstract. The transport-geographical location significantly determines the socio-economic development of a country or region. In this regard, the city of Batumi has an excellent transport-geographical location, which has not yet been fully utilized. Therefore, studying the current situation and conducting research on solving the problems is quite relevant. This paper, using traditional and modern research methods, evaluates the main characteristics of Batumi's transport-geographical location. The role of transport-geographical location in the functioning of individual types of transport is discussed, and priority transport directions are identified. The challenges faced by the transport-geographical location and their negative impact on the efficient functioning of transport communications are determined. The main characteristics of transport economic activities are analyzed, and existing problems are identified. A comprehensive approach establishes the priorities of individual types of transport and their role in the harmonious functioning of the city's internal territorial systems. Accordingly, the perspectives of further use of the transport-geographical location are substantiated, and measures to be taken in the logistics direction are outlined.

Keywords: location, communication, transport, economy

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Introduction. Georgia is a country distinguished by its transport-geographical location on the global scale. However, due to its geopolitical position, this potential is not fully utilized, especially in the regional context. Consequently, this study examines the challenges facing the transport-geographical location of Batumi and explores prospects for its further use.

The main goal of the research is to assess the key characteristics of Batumi's transport-geographical location, identify existing challenges, and explore prospects for its further use. To achieve this goal, the following tasks need to be addressed:

– Determine role of Batumi's transport-geographical location in the national transport system;

– Evaluate the main characteristics of Batumi's transport-geographical location and identify development prospects for different types of transportation;

– Identify the challenges associated with Batumi's transport-geographical location;

– Outline the main directions for the further use of Batumi's transport-geographical potential;

– Establish key strategies for optimizing Batumi's transport-geographical position to enhance the country's unified transport system.

The research focuses on the city of Batumi, which covers an area of 64.9 square kilometers and had a population of 179,200 as of 2023.

Research Methods. Various research methods were used in this study, including statistical analysis, comparative analysis, spatial-temporal analysis, field research, geo-information methods, and others.

The database for this study is based on data from the National Statistics Office of Georgia, the Batumi City Hall, and field research materials. Also, the theoretical materials related to transport development in Georgia and worldwide.

Discussion. Georgia has one of the most strategic geopolitical locations in the world, characterized primarily by its advantageous transport-geographical position. As a result, the country's development largely depends on maximizing the use of its available resources, including its transport-geographical advantages, which enables Georgia to evolve into a multifunctional regional hub.

Research conducted in this field (Dolbaia T., 2021); (Kyerenchhiladze R., 1986); (Tkeshelashvili G., 2015). has assessed Georgia's transport potential on the one hand and, on the other hand, has provided recommendations to enhance the utilization of this potential on a regional scale (Gitolendia B., 2018); (Putkaradze M., 2001); (Putkaradze M., 2009). In this regard, Batumi, which once had a relatively isolated transport network, has now become one of the most strategically positioned transport-geographical areas in the country, playing a crucial role in the implementation of the TRACEKA (Transport Corridor Europe-Caucasus-Asia) project.

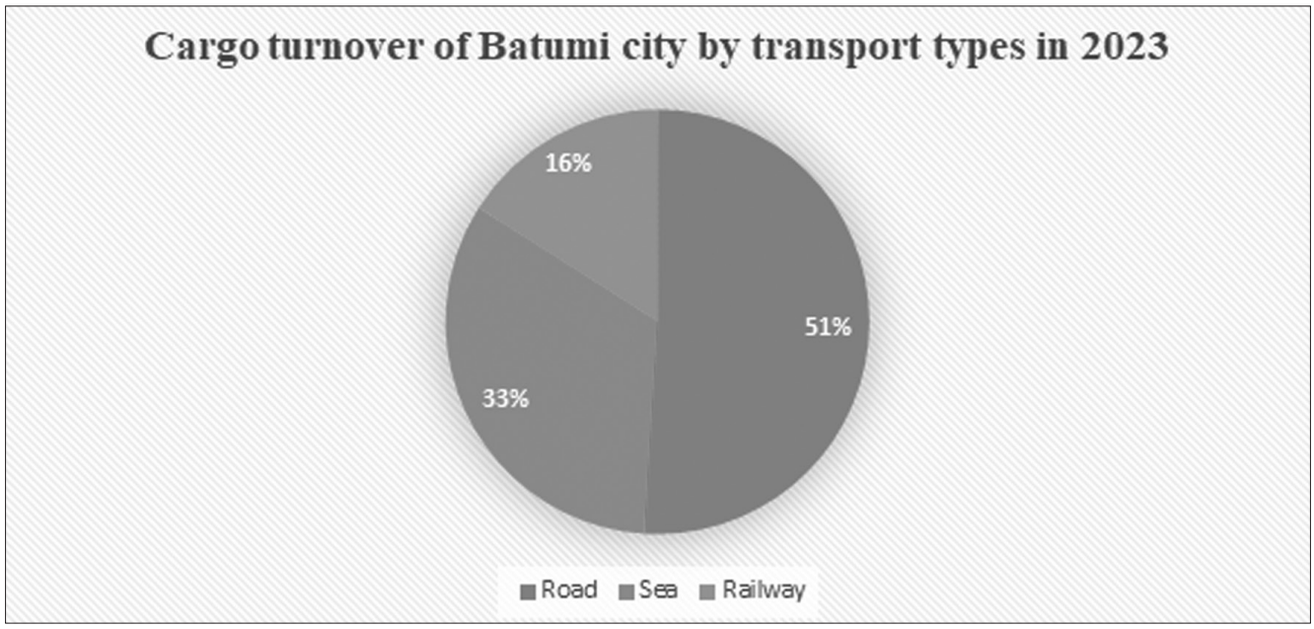
Before defining the main goal of this research, it is essential to evaluate the key characteristics of Batumi's transport-geographical location, which can be prioritized as follows:

1. It is located in the extreme southwestern border of the Georgian section of the TRACEKA transport corridor;
2. The city has direct access to the Black Sea, featuring a deep-water seaport;
3. The TRACEKA highway passes through Batumi;
4. The Batumi-Akhaltsikhe international highway facilitates connections with neighboring countries and the southern regions of Georgia;
5. The city was once a key point for the Baku-Batumi oil pipeline (currently not operational);
6. Batumi is part of Georgia's main gas pipeline network, with the southwestern section supplying gas to both the city and the mountainous Adjara municipalities;
7. Batumi has an international airport that facilitates connections with the outside world;
8. The Samtredia-Batumi segment of Georgia's railway corridor passes through the city, playing a crucial role in international cargo transportation and tourists transit.

By evaluating the key characteristics of Batumi's transport-geographical location, it becomes possible to determine the priority transport sectors for the city and the challenges they face. Currently, Batumi operates almost all modern forms of transportation, including road, railway, maritime, pipeline, electric, and air transport.

If we assess based on key economic indicators such as cargo turnover and passenger turnover, the city's transport activity in 2023 recorded approximately 13.11 million ton-kilometers of cargo turnover and 88.75 million passenger-kilometers of passenger turnover. Quantitative indicators of cargo and passenger turnover by type of transport are presented in Diagram 1 and Table 1.

Diagram 1



Source: The diagram is calculated based on data from the National Statistics Service of Georgia, Batumi City Hall and field materials.

Table 1. Passenger turnover of Batumi city by transport types in 2023

Transport types	Passenger/Kilometer	%
Road	86950000	97,9
Railway	1100000	1,2
Air	650000	0,7
Electric	70000	0,15
Sea	10000	0,05
Total	**88780000**	**100**

Source: The Table is calculated based on data from the National Statistics Service of Georgia, Batumi City Hall and field materials.

Diagram 1 and Table 1 indicate that the majority of both cargo and passenger turnover in Batumi comes from road transport. Consequently, road transport is the main among the types of transport in the city, playing a crucial role in both internal and external economic connections. The role of road transport is a priority for Batumi, which is highlighted by the following characteristics:

1. The southernmost section of the Georgian section of TRACEKA passes through the city of Batumi, connecting our country with Turkey;
2. The second international Highway – Batumi-Akhaltsikhe passes through Batumi city and it connects Batumi to Georgia's southern regions, as well as Armenia, and other countries;
3. The road transport is essential for the city's primary economic activities, both in terms of cargo and passenger turnover;
4. Road transport facilitates the operations of maritime and air transport in Batumi;
5. It serves as the main means of transport for tourists accessibility, enabling the efficient delivery of tourist products in both Batumi and Adjara region;
6. Road transport supports economic and social needs of the population within the city's internal territorial systems;

Maritime transport is equally important for the city. The Batumi Seaport is one of the deepest ports on the Black Sea, with a 12-13 meter deep fairway, allowing it to accommodate vessels with a tonnage of 60,000-70,000. The international significance of the port is evident from its historical status as a „Porto Franco“ (Free Port) between 1878 and 1886, playing a crucial role in the economic activities of the Russian and Ottoman Empires. The potential of Batumi's port was a key factor in the construction and operation of the Baku-Batumi oil pipeline.

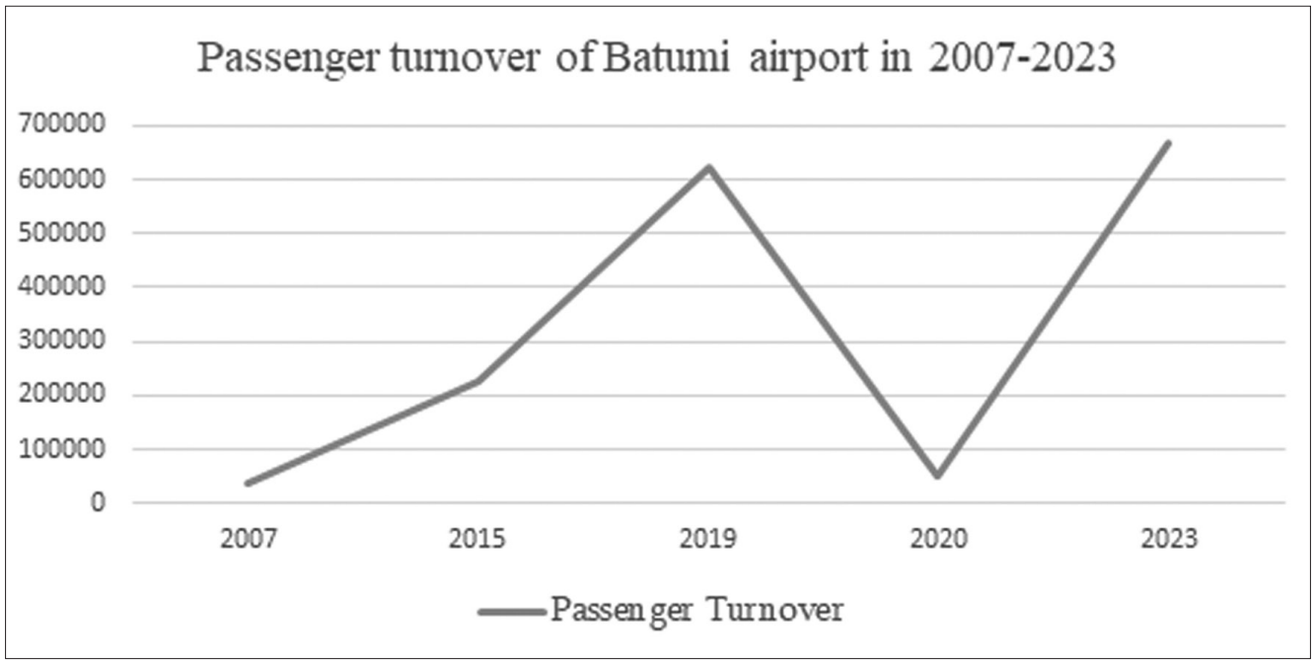
During the Soviet period, Batumi's port was further developed, with the construction of berths for cargo and passenger turnover, as well as technical service facilities. An outer port was built, and in the post-Soviet period, additional infrastructure was added, including: A ferry terminal (serving routes to Varna, Illichivsk, Poti), a container terminal with an annual capacity of 100,000 AEU, a new oil terminal with a throughput capacity of 15 million tons per year, also the port is provided with the warehouse facilities.

In terms of passenger turnover, a significant role is played by Batumi Alexander Kartveli International Airport, which was reopened in 2007 following Turkish investment (the airport has been operating since the 1950s.). It is currently managed by TAV Georgia LLC.

Runway length is 2,600 meters, passenger capacity up to 400 passengers per hour.

The airport's main economic activity is passenger turnover, with its traffic dynamics illustrated in Diagram 2.

Diagram 2



Source: The diagram is based on data from Batumi Airport.

The diagram 2 shows that passenger turnover at the airport has been growing dynamically over the years, specifically: in 2007 – 38 650 passengers, in 2015 – 226 476, in 2019 – 624 151, in 2020 – 51 412 (the COVID pandemic period), and in 2023 – 665 500. The airport serves both local and international passengers. The majority of passengers are tourists. Accordingly, with the development of tourism, the role and importance of Batumi airport will further increase.

An important type of transport for Batumi city is the railway, which was put into operation in 1883 as part of the Baku-Batumi railway line for oil transportation. Currently, railway transport is part of the international transit corridor TRACEKA. In terms of cargo turnover, it mainly serves the transportation of crude oil and dry cargo. In recent years, the total cargo turnover has ranged between 2-2.5 million tons. Railway transport handles both international and internal regional passenger turnover within the

country. By 2023, passenger turnover on the railway amounted to 1.1 million passenger-kilometers. A significant portion of the passengers are tourists.

Batumi also has electric transport. In 2013, the „Argo“ cable car was opened, with a length of 2586 meters, rising to an elevation of 256 meters above sea level on the Sameba hill. The cable car has a capacity of 500 passengers per hour. It is mainly used by tourists.

Pipeline transport plays a certain role in Batumi's cargo turnover. The world's first main oil pipeline, Baku-Batumi, started operating in 1907. Currently, it is no longer in operation. Batumi's gasification began intensively in the late 1990s. At present, the entire city is fully gasified.

The analysis of quantitative indicators for individual types of transport shows that the priority in Batumi belongs to road, maritime, and air transport. Also, other types of transport (railway, electric, pipeline) play an essential role in the effective functioning of the city's integrated transport system and, together with other sectors of the economy, create the necessary conditions for a harmonious life.

Naturally, the transport-geographical location of Batumi can not be the determining factor for the complete development of all transport types, as it is associated with certain problems. The challenges in this regard for the effective functioning of individual transport types are as follows:

1. A significant challenge in the development of road transport is the low capacity of existing road communications, which is related to the city's geographical location;

2. The international road corridor TRACEKA passes through Batumi, which can not ensure the normal flow of both transit trucks and tourist traffic, especially during the summer period;

3. The road connecting Batumi with the four municipalities of Adjara (Khelvachauri, Keda, Shuakhevi, Khulo) can not fully ensure cargo and passenger turnover, resulting in traffic jams in many parts of the city;

4. The large number of cars in the city and their movement throughout the year on central streets (Rustaveli, Chavchavadze, Gorgiladze, Aghmashenebeli, Abuseridze) create traffic jams;

5. The rapid growth in the number of vehicles in the city, as well as the traffic jams on certain streets, increase the contribution of transport to the total carbon emissions (in 1990, it was 42%, and in 2005-2008 – 95%);

6. Batumi port with its natural characteristics (2-13 meter deep fairway), is not fully utilized due to ineffective management and cannot compete with Poti port;

7. Batumi port despite being located in a recreational region, is less involved in the development of cruise tourism, which impacts negatively on the attraction of investments to the region;

8. The geographical location limits the development of railway transport due to the dead-end nature of the railway line;

9. Batumi Airport, despite its convenient geographical location, cannot function fully due to the length of its runway and certain climatic characteristics;

10. The role of pipeline transport is limited compared to previous years, as its operation was initially focused on the natural characteristics of Batumi port, which is a result of the competition caused by the diversification of oil transport routes in modern times.

The analysis shows that the transport-geographical location of Batumi plays a significant role in the socio-economic development of the region. However, there are still certain challenges in fully utilizing the existing potential. Accordingly, there are the following prospects for maximizing the existing potential:

1. The newly opened TRACEKA road corridor should be fully activated in a timely manner, which will greatly enhance both the transit of freight and the accessibility of transport for tourists;

2. To prevent traffic jams in the city, the communication links with neighboring municipalities should be optimized as much as possible, also certain streets need to implement electronic navigation systems to regulate traffic;

3. The full utilization of potential of natural and economic-geographical location of Batumi sea port requires effective logistics implementation;

4. To develop cruise tourism at the seaport, it is necessary to attract tourist flows and increase the advertising of tourism products available in the region in vulnerable countries;

5. There are significant prospects for increasing the role of electric transport, especially by launching cable cars at recreational areas such as Kvariati and Green Cape, to provide tourists with comfortable access to the area;

6. The increase in passenger turnover at Batumi International Airport will largely depend on the extension of the runway and the implementation of effective management;

7. The full utilization of potential of Batumi's transport-geographical location should be based on the principles of rational nature management and on ecological principles of optimal use of the urban environment;

8. The maximum utilization of Batumi's transport-geographical location through effective logistics will significantly improve the harmonious functioning of the city's internal territorial systems and contribute to the socio-economic growth of the region.

Conclusion. The study shows that Batumi has an excellent transport-geographical location, with key characteristics such as its position on the TRACEKA corridor, coastal and border location, place in a recreational region and other circumstances play a contributing role in the functioning of all types of transport. Special priority is given to road, maritime, and air transport. However, the functioning of other transport types is equally important. The research shows that the existing resources are not yet fully used, and the main challenge remains the issues related to the effective use of natural characteristics and logistics in the transport sector. Therefore, the proposed recommendations for solving these problems and fully utilizing the transport-geographical location potential will significantly improve the functioning of Batumi's transport system and contribute to the country's socio-economic development.

References:

Dolbaia T. (2021). *Transport and Communications of Georgia. Public Geography of Georgia.* Tbilisi: „University Press".

Gitolendia B. (2018). *Analysis of the interoperability with European systems and intermodeling .* Tbilisi: „Technikal University".

Kyerenchhiladze R. (1986). *Transport of Georgia.* Tbilisi: „Scienes".

Putkaradze M. (2001). *Adjara (Economic-geographical characteristics.* Batumi: „ Batumi University".

Putkaradze M. (2009). Geograpical aspects of transport development in Georgia. *Conference materials of the Fakulty of Busnesiss and Manegments of Batumi Academy* (pp. 46-54). Batumi: „Academy Prsss".

Tkeshelashvili G. (2015). The development of the TRACEKA transport corridor. *„ Transport and Mechanical Enginering"*