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STRATEGIC DIRECTIONS FOR THE DEVELOPMENT OF CHISINAU MUNICIPALITY PUBLIC TRANSPORT SYSTEM

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Abstract. The assessment of the current state of the public transport system in Chisinau highlights the existence of an extensive urban and suburban transport network as well as the significant increase in the volume of passengers transported during the analyzed period. The analysis of statistical data demonstrates the consolidation of the role of electric transport in urban mobility and the partial modernization of the fleet by introducing new trolleybuses and buses. At the same time, multiple deficiencies related to the overlapping of routes, traffic congestion, the state of road infrastructure, reduced accessibility for people with reduced mobility and the insufficient level of digitalization and operational coordination were identified. The study of the activity of the public transport system in Chisinau aimed at applying SWOT analysis and examining modern public transport development strategies in order to substantiate efficient, sustainable strategic directions adapted to the needs of the municipality.

Keywords: *SWOT analysis, population mobility, infrastructure, public authorities, public transport, costs, efficiency.*

Rezumat. Evaluarea stării actuale a sistemului de transport public din municipiul Chișinău evidențiază existența unei rețele extinse de transport urban și suburban, precum și creșterea semnificativă a volumului de pasageri transportați în perioada analizată. Analiza datelor statistice demonstrează consolidarea rolului transportului electric în mobilitatea urbană și modernizarea parțială a parcului rulant prin introducerea troleibuzelor și autobuzelor noi. Totodată, au fost identificate multiple deficiențe legate de suprapunerea rutelor, congestionarea traficului, starea infrastructurii rutiere, accesibilitatea redusă pentru persoanele cu mobilitate redusă și nivelul insuficient de digitalizare și coordonare operațională. Studiul activității sistemului de transport public din Chișinău a avut ca scop examinarea strategiilor moderne de dezvoltare a transportului public prin aplicarea analizei SWOT în vederea fundamentării unor direcții strategice eficiente, durabile și adaptate nevoilor municipiului.

Cuvinte cheie: *analiza SWOT, mobilitatea populației, infrastructura, autoritățile publice, mijloace de transport public, costuri, eficiență.*

1. Introduction

In the context of the accelerated development of the urban environment and the continuous increase in population mobility, the urban public transport system represents one of the fundamental elements of the municipal infrastructure, playing a decisive role in the efficient functioning of the city. The level of development of public transport directly influences population mobility, territorial accessibility, economic development, environmental quality and the degree of comfort of residents [1-6].

Chisinau is characterized by a permanent increase in passenger flows, the expansion of suburban residential areas and the increase in road traffic intensity, which generates significant pressures on the existing public transport system [7, 8]. Under these conditions, the efficiency of urban public transport depends on the level of organization of the route network, the structure and technical condition of the fleet, the degree of coordination between transport operators, as well as the capacity of the urban infrastructure to ensure the smooth flow of traffic.

The analysis of the urban public transport system requires a complex approach, based on the evaluation of the technical, economic, organizational and operational factors that influence its activity. In this context, the SWOT analysis represents an effective analytical tool for identifying the strengths and existing deficiencies of the system, as well as for determining the development opportunities and external risk factors that may influence its functioning [9].

Applying SWOT analysis allows for an objective assessment of the current state of the public transport system in Chisinau, identification of efficiency reserves and substantiation of strategic directions aimed at modernizing the infrastructure, optimizing the transport network, increasing the quality of services and developing a sustainable and competitive urban mobility system.

2. Theoretical foundations analysis regarding the organization and development of modern urban public transport systems

The modern concept of organizing urban public transport involves reducing dependence on individual cars and orienting the population towards the use of collective transport, pedestrian travel and alternative transport (bicycles, electric scooters, etc.). This objective is achieved by developing integrated transport systems, based on the coordination of different modes of transport: buses, trolleybuses, trams, LRT (Light Rail Transit), metro, suburban trains and intermodal transport.

An important principle of modern European systems is the organization of the transport network based on intermodal nodes. These allow for quick and convenient transfer between different types of transport, reducing the total travel time and increasing the attractiveness of public transport. At the same time, special attention is paid to the priority of public transport in traffic through: dedicated lanes; intelligent traffic lights; limiting car access to central areas; expanding pedestrian areas; developing infrastructure for electric transport.

Another important theoretical foundation is the concept of "accessibility-oriented mobility", according to which the efficiency of the transport system is evaluated not only by the speed of travel, but also by the population's ability to quickly and comfortably reach the main points of urban interest: workplaces, educational institutions, shopping centers and residential areas [8, 10-12].

Modern European systems widely use intelligent ITS (Intelligent Transport Systems) technologies, which include: GPS monitoring of public transport; real-time passenger information; electronic toll systems; automated traffic management; optimization of traffic schedules based on real passenger flows.

Also, the development of European urban transport is closely linked to the objectives of reducing pollutant emissions and energy consumption. For this reason, many European cities are implementing electric transport, hybrid or hydrogen buses and limiting the circulation of vehicles with conventional engines in central areas.

3. Evaluation of the current state of the public transport system in Chisinau municipality from the perspective of infrastructure, accessibility and efficiency of services

The public transport system in Chisinau has an extensive urban and suburban transport network, which ensures the accessibility of most residential areas both in the city and in suburban localities.

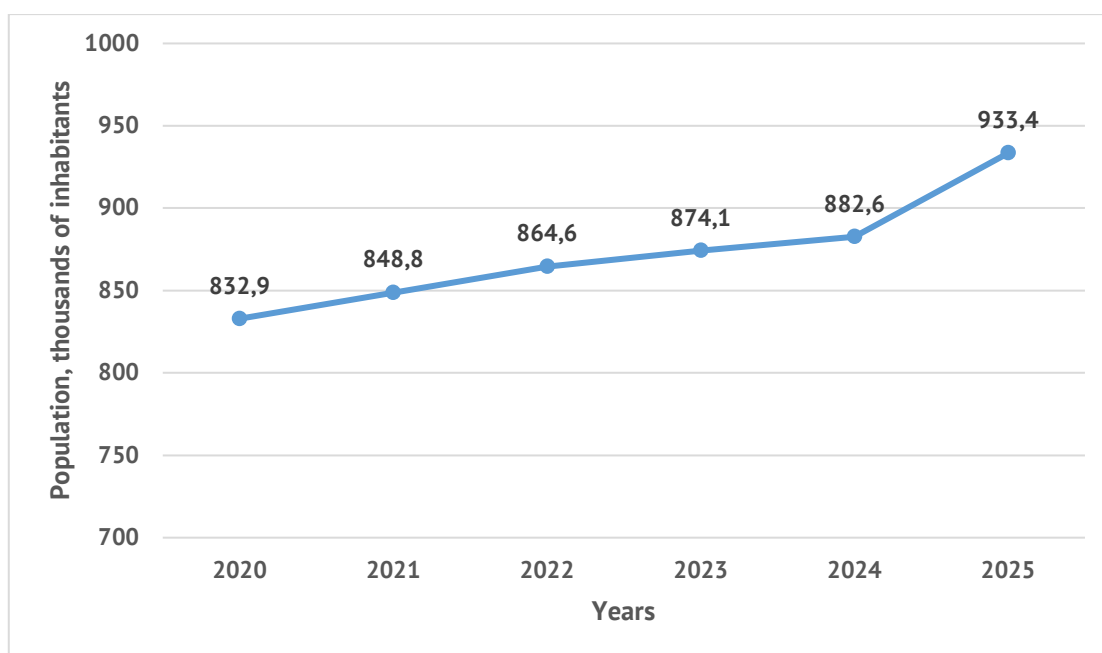


Figure 1. Dynamics of individuals with a place of residence in the municipality of Chisinau, thousand people.

Data on the evolution of the population of Chisinau municipality in the period 2020–2025 highlight a constant trend of increasing the number of inhabitants [13-15]. The number of individuals with a place to live in the municipality increased from 832.9 thousand inhabitants in 2020 to 933.4 thousand inhabitants in 2025, which represents an increase of approximately 100.5 thousand inhabitants or about 12.1 % (Fig. 1).

The analysis of the data in Figure 2 highlights a significant development of the public transport system in Chisinau municipality during the period 2020–2025, both by increasing the volume of transported passengers and by expanding the route network.

The total volume of passengers transported annually increased from 132.4 million passengers in 2020 to 276.0 million passengers in 2025, which represents an increase of more than 2 times. This dynamic indicates the growth of demand for public transport and increased population mobility.

Electric transport continues to represent the basis of the urban transport system. The number of passengers transported by trolleybuses increased from 103.3 million to 199.8 million passengers (+93.4 %), while maintaining the number of routes almost constant (30–32 routes) [15, 16]. This fact demonstrates the increase in the efficiency of electric transport exploitation by modernizing the fleet and increasing transport capacity. At the same time, an accelerated development of bus and minibus transport is observed. The number of bus routes has increased from 23 to 35 routes, mainly due to the expansion of suburban transport. The volume of passengers transported by buses and minibuses has increased from 29.1 million to 76.3 million passengers, which confirms the increasing role of suburban transport [16].

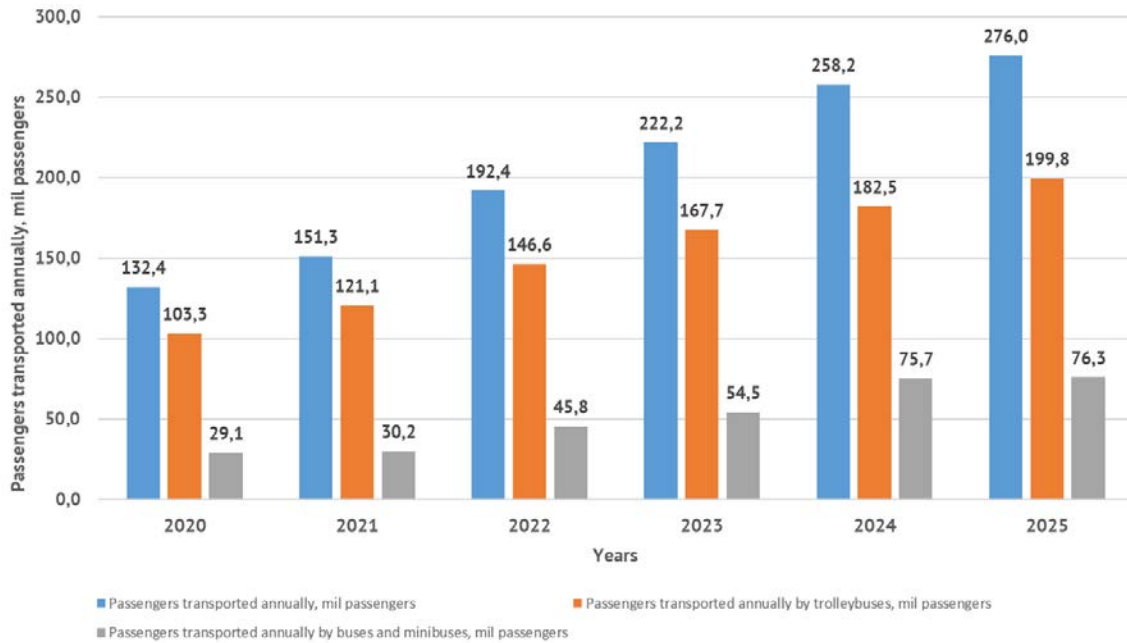


Figure 2. Dynamics of passengers transported by the public transport system in Chisinau [12], [13].

An important advantage of the public transport system is the high degree of use of electric transport. In 2025, 467 trolleybuses were in operation, which constitutes approximately 68.5 % of the total public transport managed by municipal operators (Table 1).

Table 1

Summary and by age structure of the municipal fleet at the end of 2025

Type of means of transport	Number of vehicles, un.	Distribution of vehicles by years of operation			
		up to 5 years	between 5-10 years	between 10-15 years	over 16 years
Trolleybuses	467	175	105	129	58
Buses	215	131	7	77	0
TOTAL	682	306	112	206	58

The analysis of the structure of the bus fleet used in public transport in Chisinau highlights the fact that most units are equipped with diesel engines, corresponding to the Euro 5 and Euro 6 pollution standards [16]. However, the predominant use of diesel buses generates emissions of pollutants, including nitrogen oxides (NO_x), fine particles and carbon dioxide (CO₂), which negatively influence the quality of urban air and the level of noise

pollution. Compared to other environmentally friendly public transport means, especially trolleybuses and electric buses, diesel buses have a higher level of environmental pollution [17].

4. Carrying out the SWOT analysis of the urban public transport system.

The analysis of the public transport system in Chisinau highlights the existence of important advantages related to the infrastructure and recent development of the fleet, but also of structural problems that influence the efficiency and quality of transport services.

Strengths

The public transport system in Chisinau has an extensive urban and suburban transport network, which allows ensuring accessibility for most inhabited areas. An important advantage is the high share of electric transport, represented by the trolleybus network, which contributes to reducing environmental pollution.

In recent years, the fleet has been partially modernized through the acquisition of new trolleybuses and buses, which has contributed to increasing transport capacity, comfort and safety of passengers. Also, the infrastructure of public transport stations is relatively well developed and located both in the city and in the suburban area.

Weaknesses

The analysis of the public transport system in Chisinau highlights the existence of a number of structural and functional deficiencies that negatively influence the efficiency and quality of services provided.

The provision of municipal enterprises predominantly with large and very large class means of transport leads to the inefficient use of the fleet on certain routes with low passenger flow, which determines the increase in operating costs, energy consumption and the level of environmental pollution.

The operation of trolleybuses on routes that include narrow-profile road sections reduces their speed and maneuverability, contributing to the formation of congestion and reducing the efficiency of urban traffic.

The high degree of overlap of public transport routes generates inefficient competition between operators, leads to uneven distribution of passenger flows and reduces the overall effectiveness of the public transport system.

The existing infrastructure and means of transport do not fully ensure the necessary conditions for access for people with disabilities and reduced mobility, which limits the accessibility and inclusiveness of public transport services.

The concentration of a large number of public transport vehicles on the central highways of the municipality contributes to overloading the road infrastructure and reducing the commercial speed of public transport.

The lack of a single monitoring and coordination center for all public transport operators limits the possibility of efficient management of traffic and operational processes in real time, based on modern automated monitoring and control systems.

The significant share of road sectors in an inadequate technical condition or in the process of rehabilitation negatively influences the operating conditions of transport means, determining the reduction of commercial speed and increasing maintenance costs.

The insufficient level of passenger information, both in public transport stations and through mobile applications, reduces information accessibility and the comfort of users of the public transport system.

Opportunities

Organizing electric trolleybus routes exclusively on arterial roads with high passenger flow will allow for more efficient use of their capacity, increase commercial speed and reduce urban traffic congestion.

The admission to servicing public transport routes of minibuses and buses, only of operators who have means of transport adapted to the actual passenger flow will ensure the rational use of the rolling stock, optimize operating costs and improve the quality of services offered to passengers.

The gradual transition to environmentally friendly public transport, through the use of hybrid or electric buses, will contribute to reducing polluting emissions, reducing urban noise levels and improving environmental quality in the municipality of Chisinau.

The creation and development of an "express" public transport network between the main sectors of the city will contribute to reducing travel time, increasing population mobility and decongesting the urban road network, especially during peak hours.

Risks

Modernization of infrastructure and renewal of the fleet require considerable financial investments.

The increase in operating costs, energy and spare parts prices may lead to an increase in transport tariffs.

There is also a risk of reducing the interest of private operators in providing public transport services in conditions where the profitability of the activity decreases or the investment recovery period becomes too long.

The instability and frequent changes in the regulatory framework in the field of public transport generate legal uncertainty and difficulties in planning, organizing and providing transport services efficiently.

Based on the presented SWOT analysis, the development of the public transport system in Chisinau should be oriented towards modernization, operational efficiency, increasing accessibility and reducing environmental impact. The proposed strategic directions aim to capitalize on existing strengths and opportunities, as well as to reduce the effects generated by the identified weaknesses and risks. Based on the above, we will present the strategic directions for the development of the public transport system in Chisinau (tab. 2).

Table 2

Development strategies for the public transport system in Chisinau municipality

Objective No. 1 - Optimization and reorganization of the public transport network		
Strategic direction	Effect	Activities
Creating an efficient, balanced public transport system adapted to real passenger flows.	- Review and restructuring of public transport routes to reduce overlaps between trolleybuses, buses and minibuses; - Introduction of the principle of hierarchical transport: trolleybuses and large buses on main roads; medium/small capacity buses on secondary and suburban routes; - Development of express transport routes between the main sectors of	- reducing travel time; - reducing traffic congestion; - increasing commercial speed; - efficient use of the fleet.

Continuation Table 2

	the municipality: Buiucani – Centru – Botanica; Rîșcani – Centru – Ciocana; • Creation of dedicated lanes for public transport on high-traffic arteries; • Implementation of the public transport prioritization system at traffic lights.	
Objective No. 2 - Modernization and diversification of the fleet		
Ensuring a modern, energy-efficient transport fleet adapted to the real needs of the population.	• Gradual acquisition of: electric buses; hybrid buses; autonomous trolleybuses; • Replacing outdated vehicles with low-energy transport means; • Introducing medium-sized buses on routes with low passenger flow; • Equipping all transport units with: GPS systems; video cameras; air conditioning; electronic toll systems; • Developing infrastructure for charging electric buses.	• reducing energy consumption; • reducing pollution; • increasing passenger comfort and safety; • reducing long-term operating costs.
Objective No. 3 - Digitalization and intelligent management of public transport		
Implementation of an integrated system for monitoring and intelligent management of public transport.	• Creation of a single municipal center for monitoring and coordinating all operators; • Implementation of an intelligent traffic management system; • Development of a unified mobile application for: route planning; real-time arrival time display; electronic payment; • Installation of electronic information panels at stations; • Collection and analysis of data on passenger flows for route optimization.	• efficient real-time traffic management; • increasing information accessibility; • improving passenger experience; • reducing delays.
Objective No. 4 - Increasing accessibility and social inclusion		
Ensuring equal access to public transport services for all categories of the population.	• Adaptation of stations and vehicles for people with disabilities: ramps; low floor; audio and visual information systems; • Modernization of sidewalks and access routes to stations; • Implementation of universal accessibility standards in new infrastructure; • Training of staff on assistance to people with reduced mobility.	• increasing social inclusion; • increasing accessibility of public transport; • improving urban mobility.

Continuation Table 2

Objective No. 5 - Modernization of road infrastructure and stations		
Improving traffic and public transport operating conditions.	• Rehabilitation of roads in poor technical condition; • Modernization of intersections with heavy traffic; • Arrangement of modern stations with: lighting; information panels; video surveillance systems; protected spaces for passengers; • Construction of intermodal terminals to connect urban and suburban routes; • Development of infrastructure for alternative transport: bicycle paths; Park&Ride parking lots.	• increasing safety and comfort; • reducing wear and tear on means of transport; • streamlining urban traffic.
Objective No. 6 - Strengthening financial and institutional sustainability		
Creating a financially stable and administratively efficient public transport system.	• Attracting external funds: European programs; international partnerships; credits for green infrastructure; • Developing public-private partnerships; • Introducing performance contracts for transport operators; • Developing a transparent compensation and subsidy mechanism; • Implementing sustainable urban mobility policies.	• increasing economic efficiency; • attracting investment; • ensuring the continuity of the modernization process.

Conclusion

The analysis of the evolution of the public transport system in Chisinau highlights the existence of a continuous process of development and modernization, determined by the increasing demand for urban mobility and the need to adapt the infrastructure to the dynamics of passenger flows. At the same time, the intensification of urban traffic and the increase in the volume of transport require the implementation of integrated measures regarding the development of road infrastructure, the optimization of the transport network and the digitalization of traffic management, in order to increase operational efficiency and reduce travel times. In this context, the modernization of the vehicle fleet and the transition to ecological public transport are essential factors for increasing the sustainability of the urban transport system, reducing the impact on the environment and improving the quality of services provided to the population [18-20].

The strategic development of the public transport system in Chisinau must be oriented towards the creation of a modern, integrated, ecological and accessible system. The implementation of the proposed measures will contribute to improving urban mobility, reducing congestion and pollution, increasing the quality of services and increasing the attractiveness of public transport for the population. The success of these directions depends

on effective cooperation between public authorities, transport operators and financial partners.

Conflicts of interest: The author declares no conflict of interest.

References

1. European Commission, Directorate General for Mobility and Transport (2021) *Raising Awareness of Alternatives to Private Car: Pilot Project: Final Report*. Luxembourg: Publications Office of the European Union, 311 p. Available online: <https://op.europa.eu/et/publication-detail/-/publication/c8105e33-509f-11eb-b59f-01aa75ed71a1> (accessed on 10.02.2026).
2. European Commission (2018) *Transport in the European Union: Current Trends and Issues*. 144 p. Available online: <https://transport.ec.europa.eu/system/files/2018-06/2018-transport-in-the-eu-current-trends-and-issues.pdf> (accessed on 10.02.2026).
3. CIVITAS (2010) *Prioritisation of Public Transport in Cities*. CIVITAS Guard Policy Advice Notes, No. 07, 12 p. Available online: https://civitas.eu/sites/default/files/civitas_ii_policy_advice_notes_07_public_transport_priority_0.pdf (accessed on 10.02.2026).
4. CIVITAS (2010) *Innovative Information Systems for Public Transport*. Policy Advice Notes, No. 09, 12 p. Available online: https://civitas.eu/sites/default/files/civitas_ii_policy_advice_notes_09_public_transport_information_0.pdf (accessed on 12.03.2026).
5. European Commission (2016) *Quality of Life in European Cities 2015. Flash Eurobarometer*. Luxembourg. Available online: <https://data.europa.eu/doi/10.2776/870421> (accessed on 15.01.2026).
6. Rotaru, I., Ceban, V. (2024) Current issues of municipal public transport systems. In: *Technical and Scientific Conference of Students, Master's and Doctoral Students*, Technical University of Moldova, Chisinau, 27–29 March 2024, Vol. 2, pp. 1347–1349. ISBN 978-9975-64-460-0. Available online: <https://repository.utm.md/bitstream/handle/5014/28356/Conf-TehStiint-UTM-StudMastDoct-2024-V2-p1347-1349.pdf?sequence=1&isAllowed=y> (accessed on 16.01.2026). [in Romanian].
7. Rotaru, I., Rusu, A. (2025) Measuring passenger satisfaction in urban public transport in Chisinau. *Journal of Engineering Science*, 31(4), 33–54. Available online: [https://doi.org/10.52326/jes.utm.2024.31\(4\).03](https://doi.org/10.52326/jes.utm.2024.31(4).03) (accessed on 16.01.2026).
8. Rotaru, I., Ceban, V. (2024) Quality of public transport services in Chisinau. *Journal of Engineering Science*, 31(2), 7–16. ISSN 2587-3474, eISSN 2587-3482. Available online: [https://doi.org/10.52326/jes.utm.2024.31\(2\).01](https://doi.org/10.52326/jes.utm.2024.31(2).01) (accessed on 16.01.2026).
9. Dodu, A. (2022) Financial instruments to reduce risks in the circular economy. In: *Economic Growth in the Conditions of Globalization: International Scientific-Practical Conference*, XVIth edition, Chisinau, 12–13 October 2022, Vol. II, pp. 88–97. ISBN 978-9975-3583-9-2; ISBN 978-9975-3385-6-1 (PDF). Available online: <https://doi.org/10.36004/nier.cecg.III.2022.16.7> (accessed on 16.02.2026). [in Romanian].
10. Chisinau Municipality City Hall (2022) *Initiative for Sustainable Development of Public Transport in Chisinau: Analysis of the Implementation of the Provisions on Public Transport in the EU–Moldova Association Agreement*. Chisinau. Available online: https://www.chisinau.md/public/files/anul_2014/strategii/strategie_transport_chisinau_2014.pdf [in Romanian].
11. Oleiniuc, M., Dodu, A. (2021) Conceptual elements of environmental management. In: *Competitiveness and Sustainable Development in the Context of European Integration*, 3rd Economic International Conference, Chisinau, 4–5 November 2021, pp. 134–139. ISBN 978-9975-45-739-2. Available online: <http://repository.utm.md/handle/5014/18385> (accessed on 19.03.2026). [in Romanian].
12. National Statistical Office of the Republic of Moldova (2025) *Chisinau in Numbers. Statistical Yearbook. Edition 2025*. Chisinau, 118 p. ISBN 978-9975-3592-2-1. Available online: https://statistica.gov.md/files/files/publicatii_electronice/Chisinau/Anuar_Chisinau_editia_2025.pdf (accessed on 16.01.2026). [in Romanian].
13. Public Service Agency (2025) *Statistical Data from the State Population Register Regarding Individuals Residing in the Republic of Moldova in Administrative-Territorial Profile*. Available online: <https://www.asp.gov.md/ro/date-deschise/date-statistice/rsp-raion> (accessed on 17.01.2026). [in Romanian].

14. Dodu, A., Odaini, D., Oleiniuc, M. (2025) *Statistics: Methodical Instructions for Carrying Out Practical Work in Statistics*. Chisinau: Tehnica-UTM, 100 p. ISBN 978-9975-64-545-4. Available online: <https://repository.utm.md/handle/5014/31658> (accessed on 23.03.2026). [in Romanian].
15. Chisinau Electric Transport Directorate (RTEC) (2025) *Report of the Management of the Municipal Enterprise Regia Transport Electric Chisinau*. Chisinau, 22 p. Available online: <https://rtec.md/wp-content/uploads/2025/06/Raport-conducere.pdf> (accessed on 23.03.2026). [in Romanian].
16. Municipal Enterprise "Urban Bus Park" (ÎM PUA) (2024) *Management Report, Year 2024*. Chisinau, 13 p. Available online: <https://rtec.md/wp-content/uploads/2025/06/Raport-conducere.pdf> (accessed on 25.03.2026). [in Romanian].
17. Dodu, A., Oleiniuc, M. (2023) Financing business models for the circular economy in the Republic of Moldova. In: *Economic Development and Research: International Scientific-Practical Conference*, Chisinau, 21–23 June 2023, pp. 270–279. ISBN 978-9975-81-149-1. Available online: <https://www.repository.utm.md/handle/5014/26856?show=full> (accessed on 09.04.2026). [in Romanian].
18. Cats, O., Reimal, T., Susilo, Y. (2014) Public transport pricing policy: empirical evidence from a fare-free scheme in Tallinn, Estonia. *Transportation Research Record: Journal of the Transportation Research Board*, 2415(1), 89–96. Available online: <https://doi.org/10.3141/2415-10> (accessed on 17.11.2025).
19. Law on the Approval of the National Development Strategy "European Moldova 2030", No. 315 of 17.11.2022 (2022) *Official Gazette of the Republic of Moldova*, 409–410, Art. 758. Available online: https://www.legis.md/cautare/getResults?doc_id=134582&lang=ro (accessed on 18.11.2025). [in Romanian].
20. Chisinau Municipality City Hall (2023) *Local Policy Report (Policy Brief) with Recommendations for Implementing the Latest Approaches in Public Transport. Project "MOVE IT like Lublin – A Chisinau Public Transport Sustainable Development Initiative"*. 28 p. Available online: https://www.chisinau.md/ro/raport-de-politici-locale-policy-brief-1-cu-recomandari-20901_274993.html (accessed on 06.04.2026). [in Romanian].

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