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**MANAGEMENT OF THE SYSTEM OF INDICATORS AND FACTORS
ENSURING THE EFFICIENCY OF IMPLEMENTING INNOVATIVE
PROJECTS IN THE FIELD OF PUBLIC TRANSPORT**

Specialty 5.2.3 Regional and Sectoral Economics

Annotation

dissertations for the degree of Candidate of Economic Sciences

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The relevance of the research topic. The current geopolitical and economic situation in the world has created a need to improve the efficiency of domestic transport sector facilities based on IT technologies and artificial intelligence. Ensuring that regions and cities have modern, innovative transport infrastructure has been declared one of the top priorities in achieving the goals of the state policy on regional development. As a result, the active digital transformation of the transport sector, including public transport in large cities, has intensified competition not only between traditional forms of mobility (public transport, taxis, etc.) and new forms (sharing services, digital platforms), but also between different types of transport (buses, trolleybuses, trams, etc.), and has led to the emergence of a number of serious problems.

Despite the active launch of innovative projects (autonomous vehicles, transport using alternative fuels, unmanned control, etc.) in the transport sector, with active support from the state and municipal authorities through the allocation of funding for their implementation (for example, the national project “Safe and High-Quality Roads” allocated 2.4 trillion rubles from the federal budget for the implementation period 2019–2024; the federal project “Infrastructure for Life” attracted additional funding of 93 billion rubles to the sector, and others), their actual performance indicators and the goals set within the specified parameters do not always match the planned ones, and sustainability is declining. This is due to the fact that at the pre-investment stage, firstly, a number of factors (temporal, organizational, technological, etc.) are often underestimated; secondly, multi-criteria analysis is not taken into account, which results in an insufficient number of indicators for economic monitoring; thirdly, there is a lack of systematic and continuous monitoring of performance indicators at the project implementation stages; fourthly, project implementation gives rise to unforeseen risks and uncertainties that could not be predicted, including due to the lack of control over the factors that influence performance at the stages of the project cycle, and so on. All of this leads to disruptions in the implementation of innovative projects, a

decrease in their actual effectiveness and the objectivity of its assessment, inefficient use of resources, and hinders the state's efforts to achieve its goals for the innovative development of regions and cities, including transport infrastructure, thereby improving the quality of life of the population.

As a result, a comprehensive approach is required that allows not only to conduct a predictive assessment of a particular innovative project in the field of public transport but also to monitor the economic performance of actual indicators, ensure the manageability of factors influencing efficiency at the stages of the project cycle, and, as a consequence, minimize risks and uncertainties, and optimize the resources and time required for its implementation. Furthermore, when creating value and cost during the implementation of an innovative project, it is necessary to ensure the quality of its results and increase the satisfaction of stakeholders by using a multi-criteria approach that takes into account economic, environmental, social, scientific and technical, and other indicators.

The development of a concept for integrating the effectiveness of implementation into a comprehensive comparative assessment of the effectiveness of innovative projects, along with its methodological tools for managing the system of indicators and factors that ensure its actual achievement, directly meets the needs of investors, including the state (municipal enterprises) and private investors, when addressing the issue of selecting priority options, taking into account their multifaceted and multi-criteria nature, as well as reducing risks and uncertainties when implementing projects under time- and resource-constrained conditions.

In this regard, studies that not only describe the specifics of pre-investment assessment of the effectiveness of innovative projects (multidimensional nature, risks, uncertainties, time constraints, etc.) but also propose methodological tools for creating and managing a system of indicators and factors ensuring effectiveness at the stages of the project cycle — integrated into the concept of a comprehensive comparative assessment of the results of innovative projects in the field of public transport — are becoming particularly important and relevant.

The degree of scientific elaboration of the problem. The impact of digital transformation on the innovative development of the public transport sector requires an increase in the competitiveness of project outcomes, which necessitates the improvement of tools for managing the quality and efficiency of implemented projects, including the system of indicators and factors. The analysis of scientific literature has shown that some of the issues raised are covered in sufficient detail, while certain aspects — including the integration of implementation efficiency into the comprehensive assessment of projects, the creation and management of a system of performance indicators and factors that take into account the specifics and particularities of public transport sector projects at the stages of the project cycle — have not been sufficiently elaborated.

The theoretical basis of the research was formed by the works of domestic and foreign scholars in the following fields:

- they studied the theory and methodology of innovative projects J.A. Schumpeter, P. Drucker, R. Archibald, R.A. Fatkhutdinov, Yu.V. Yakovets, A.I. Anchishkin, S.Y. Glazyev, D.S. Lvov, N.D. Kondratiev, E. A. Gaiduk, M. A. Afonasyova, E.E. Petrova, A.I. Sablina, P.O. Teslenko, I.A. Lapkina, M. A. Blum, O. V. Korobova, V.G. Odnokoz, Yu.I. Ryazheva, M.A. Blum, Ya.V. Savchenko, V.D. Hartman, E. Mansfield, R. Foster, B. Twiss, E. Rogers and others.

- studies of the theoretical and methodological aspects of managing the effectiveness of innovative projects, its indicators and factors, were conducted in the following works: M. Alley, V.Yu. Konotopsky, N.M. Tyukavkin, Yu.M. Nerush, E. I. Kutsenko, D.R. Zainullina, A.A. Kostylev, A.M. Batkovsky, A. Bochkarev, I. V. Karapetyants, G. G. Levkin, M. N. Grigoriev, G. S. Vechkanov, V. E. Nikolaichuk, V. A. Shabaeva, V. B. Batienskaya, L. M. Teslyuk, A.V. Rumyantseva, S. K. Demchenko, T. A. Melnikova, A. G. Badalova, E. Y. Vasilyeva, A.V. Oleinik, V. Kelle, F. P. Boer, I. B. Guseva, and others.

- the assessment of the effectiveness of innovative projects, including comprehensive evaluation, the creation of a system of indicators, and evaluation methods, is reflected in the following works: T.S. Khachaturova, L. Richter, V.N.

Livshits, I.A. Mironov, A.N. Shvetsov, S.N. Yashin, N.V. Kapustin, D.M. Safina, S.V. Kaleev, O.S. Boronina, V.V. Savalei, I. P. Altova, I.V. Babyna, Ya.A. Meller, V.M. Anshina, E. Verzhukh, A. A. Alayeva, S. V. Kozlova, K. M. Malyutina, I. T. Perova, V. A. Zarenkova, M. S. Kuvshinov, N. S. Komarova and other researchers, as well as in regulatory and legal documents and relevant international and domestic standards.

- the study of the effectiveness and quality of innovative projects at different stages of their life cycle, as well as the limitations and risks that arise during their implementation, was carried out by: Neave Henry R., Rosenberg I. N., Polyakov N. A., R. I. Gilmanov, M. G. Kruglov, D. R. Zainullina, R. R. Khalitov, I. V. Lukyanov, N. A. Shishkin, V. A. Shabaev, V. B. Batievskaya, T. N. Syrova, V. P. Boyko, N. A. Zakharov, E. A. Panfilova, and others.

- they focused on the specifics of the innovative development of the transport sector, including the distinctive features of innovative projects in the field of public transport: B.M. Lapidus, D.A. Macheret, A.G. Badalova, E.Yu. Vasilyeva, A.V. Oleinik, T.V. Konovalova, N.N. Bulatova, O.I. Gulakova, Yu.V. Dubrovskaya, S. Devarajan, V. Swaroop, H. F. Zou, H. Lining, F. Duchin, E. Morgenroth, H. Khan, U. Li, J. Jiang, M. AsifKhan, S. Nawaz, I. U. Mangla, R. P. Pradhan, M. B. Arvin, M. Nair, T. Vällilä, G. L. Wu, Q. Feng, Z. A. Wang and others.

An analysis of the works of domestic and foreign scholars has shown that the scientific literature has sufficiently thoroughly examined issues related to the conceptual framework, the multifaceted and multi-criteria nature of the effectiveness of innovative projects, performance indicators, the factors influencing effectiveness and methods for assessing it, risks and uncertainties, the stages of the life cycle of innovative projects, and the specifics of innovative development in the transport sector, including the features of innovative projects in the field of public transport. However, despite the diversity of areas and the depth of research in the field under study, a number of gaps have been identified:

- the absence of a unified concept for a comprehensive comparative assessment of the effectiveness and selection of priority options for innovative

projects to be implemented and scaled up in the public transport sector, taking into account the actual data on the effectiveness of project implementation;

- the issues related to the creation and management of a system of indicators and factors to ensure the effectiveness of implementing innovative projects in the field of public transport, taking into account risks, uncertainties, and time and resource constraints, have not been fully explored;

- the mechanisms for managing the implementation of a socially valuable innovative project based on monitoring its actual effectiveness, etc., have been poorly studied.

Thus, despite the significance of the results obtained during the research, the issues of creating and managing a system of indicators and factors to ensure the effectiveness of implementing innovative projects in the field of public transport remain relevant and require the development of a theoretical and methodological framework.

Taking this into account, the topic of the dissertation research has been formulated, and its goal and objectives have been defined.

The purpose of the study - to examine the theoretical and methodological foundations and develop a methodological framework for interconnected management of a system of indicators and factors ensuring the effectiveness of participants' implementation of innovative projects in the field of public transport at each stage of its implementation.

The stated goal predetermined the formulation and consistent resolution of **the following tasks:**

- to examine innovative infrastructure projects in the public sector and identify their essence and the specific features that contribute to their effectiveness;
- develop a concept for the project's transition to the stage of achievable efficiency and quality assurance;
- identify the indicators and factors that ensure the effectiveness and quality of the project during its implementation;

- to develop a system of indicators that reflect the factors controlling the effectiveness of the project being implemented;

- develop a methodology for interrelated management of a system of indicators by participants in an innovative project at each stage of its implementation;

- conduct a practice-oriented testing of the developed methodology and assess its effectiveness.

The supertask is:

- to demonstrate the effectiveness of a socially valuable innovative project and to supplement the mechanism for managing its implementation with monitoring of the actual effectiveness achieved through the regulation of dynamic factors reflected by decomposed indicators.

The object of the study is innovative projects in the field of public transport.

The subject of the study is economic and managerial relationships that ensure the management of a system of indicators and factors to ensure the effectiveness of implementing innovative projects in the field of public transport.

The theoretical and methodological basis of the study consists of the works of domestic and foreign scholars in the field of the theoretical and methodological foundations of innovative projects, including the classification of projects, indicators and factors of efficiency, methods for assessing and analyzing economic efficiency, as well as Methodological Recommendations approved by resolutions of the Government of the Russian Federation and federal laws of the Russian Federation on managing the economic efficiency of innovative projects, and international and domestic standards.

The author relied on modern theories of performance management, including those related to innovative projects (the “Cost-Benefit Analysis” method, the “Earned Value” method, the “Cost-Benefit Analysis” method, the “Expert Judgment” method, factor analysis (the “Proportional Division” method));

innovation project management (the “Constraint Triangle”, the “Project Life Cycle”, the “Deming” cycle), and others.

The dissertation used a set of general scientific approaches: deductive, abstract-logical, structural-functional, complex, systemic. As research tools, both general scientific methods are used: analysis and synthesis, comparison and generalization, analogy, and specific: formalization, economic and statistical, graphical, tabular, etc.

The information and empirical basis of the study is formed on the basis of official data from the Federal State Statistics Service on production, economic, and project activities in the transport sector, materials from research conducted by domestic and foreign scholars, scientific and practical conferences and seminars, periodicals, and the Internet.

The empirical basis consists of the results of a study of the existing project management system and the mechanism for assessing its effectiveness, conducted at the Center for Research and Development of Unmanned Transport at the Directorate of Information Technology Systems and Communications Systems of the Moscow Metro, Moscow.

During the pilot testing of the methodology in 2024–2025, recommendations were implemented to reduce costs and restore the balance of the “Constraint Triangle,” the organization of employees’ work was improved, and the threat of risks and uncertainties that arose during the project implementation phase was reduced. This contributed to an increase in the effectiveness of the results of the innovative “Unmanned Tram” project based at the Center for Research and Development of Unmanned Transport of the Directorate of Information Technology Systems and Communication Systems of the State Unitary Enterprise “Moscow Metro,” Moscow.

The scope of the research corresponds to the following items in the Passport of the scientific specialty 5.2.3. Regional and sectoral economics: item 7.1. “Theoretical and methodological foundations for analyzing problems of

innovative development and innovation policy,” item 7.8. “Theory, methodology, and methods for assessing the effectiveness of innovative projects and programs.”

The scientific novelty of the dissertation research lies in the following:

- the integration of the theoretical and methodological framework for managing a system of indicators and factors ensuring the effectiveness of implementing innovative projects in the public transport sector has been proposed and substantiated as part of a comprehensive comparative assessment of priority options. This makes it possible to ensure the actual implementation and proactive management of project effectiveness, to monitor dynamic factors, which minimize risks and uncertainties given time and resource constraints, and also increases the objectivity of assessing and selecting priority options, taking into account the identified characteristics of public transport projects. This is achieved by using the indicators introduced into the author’s system: the “integrated indicator of the effectiveness of innovative projects” and the “single indicator of the effectiveness of an innovative project,” as well as the formulas for calculating them.

- the overarching goal has been achieved: the effectiveness of a socially valuable innovative project has been demonstrated, and the mechanism for managing its implementation has been supplemented with monitoring of the actual effectiveness achieved through the regulation of dynamic factors reflected by decomposed indicators.

The scientific results obtained by the applicant and submitted for defense:

1. The necessity of proactively refining project performance assessments and monitoring the factors influencing it during the project implementation process in order to make timely corrections and reduce risks is substantiated. Unlike the existing assessment scheme, which is of a predictive nature, this approach also takes into account actual data, which ensures a comprehensive comparative assessment of the selected options, minimizing potential risks and uncertainties (clause 7.8. “Theory, methodology and methods for assessing the effectiveness of innovative projects and programs” of the passport of the specialty 5.2.3 “Regional and sectoral economics”).

2. The indicators of the effectiveness of the innovative project implementation have been linked to the processes that ensure its implementation and the quality of the project results, based on the Deming cycle (the PDCA cycle). Unlike the existing separate management of the efficiency and quality of innovative projects, this approach ensures simultaneous, comprehensive management of their indicators within the framework of the Deming cycle functions (clause 7.1 “Theoretical and methodological foundations for analyzing the problems of innovative development and innovation policy”, clause 7.8 “Theory, methodology and methods for assessing the effectiveness of innovative projects and programs” of the passport of specialty 5.2.3 “Regional and sectoral economics”).

3. A decomposable system of indicators has been developed, reflecting the dynamic factors influencing the effectiveness of the project being implemented. Unlike the existing ones, it is integrated into a multi-stage system of indicators for the comparative assessment of the integrated effectiveness of projects, it is a multi-level structure consisting of high-level (general) and lower-level (decomposed) indicators linked to specific stages and performers, which allows us to show the formation of the effectiveness of a socially valuable innovative project and monitor the actual effectiveness through the regulation of dynamic factors. reflected by decomposed indicators (clause 7.1. "Theoretical and methodological foundations of the analysis of problems of innovative development and innovation policy", clause 7.8. "Theory, methodology and methods of evaluating the effectiveness of innovative projects and programs" Passport specialty 5.2.3 "Regional and sectoral economics").

4. A methodology has been developed for interconnected management of a system of indicators of the effectiveness of an innovative project, based on the stages of its implementation. Unlike the existing ones, it differs in its versatility (meaning commonality for innovative projects in the public sector, commonality of their phase assessment and common functions in the project cycle), an integrated system of indicators and evaluation methods, describes the entire management

cycle of the performance indicators system (not limited to one of the functions, for example, evaluation), which ensures the achievement of efficiency and the quality of the innovation project in accordance with the set goals and objectives, in conditions of limited time and resources, while minimizing the risks and uncertainties that arise (clause 7.8. "Theory, methodology and methods for evaluating the effectiveness of innovative projects and programs" Passport specialty 5.2.3 "Regional and sectoral economics").

The theoretical significance of the study lies in the fact that the theoretical and methodological results obtained, as well as the methodological provisions developed and tested in practice for managing the system of indicators and factors ensuring the effectiveness of implementing innovative projects in the field of public transport, update and develop the methodology and methods for managing the effectiveness of innovative projects, as well as the theory of managing project risks and uncertainties. They can serve as foundational material for further research aimed at improving the effectiveness of the results of innovative projects. The theoretical and methodological provisions and conclusions of the dissertation research can be used in the educational process, in particular in teaching the disciplines "Project Management", "Economics and Business Planning", and "Assessment of the Effectiveness of Investment Projects", in higher education programs in the field of "Economics", and in research work.

The practical significance of the research results lies in the practical application of the provisions of the author's methodology for managing the system of indicators and factors for ensuring the effectiveness of innovative projects in the field of public transport by companies, enterprises, organizations to improve the effectiveness management of innovative projects in order to increase it. The applied nature of a number of provisions and conclusions concerning, in particular, methodological tools for managing the system of indicators and factors for ensuring the effectiveness of innovative projects in the field of public transport, proposals for labor optimization, and others are of interest to managers and

specialists of design organizations, customers, investors, and others involved in the development and implementation of similar projects.

Testing the research results. The research results were discussed and tested at international conferences: the VI International Scientific Conference “Current Issues in Management, Economics, and Economic Security” (Kostanay, Kazakhstan, 2024), “Prospects for the Reform and Sustainable Development of the National Economy” (Tashkent, Uzbekistan, 2024), the XXI International Plekhanov Readings (Ulaanbaatar, Mongolia, 2025), and the international scientific and practical conference “The Economy of Russia in the Context of Modern Challenges” (Chuvashia, 2026); at all-Russian and interregional scientific and practical conferences (hereinafter referred to as SPCs): the 5th All-Russian SPC “Socio-Economic Development of Russian Regions: Trends, Problems, Prospects” (Orenburg, 2024); the 3rd Interregional SPC “Applied Digital Technologies and Systems of the 21st Century: Economics, Management, Personnel Management, Information Security, Law” (Vladimir, 2023), the All-Russian SPC “Economics and Sustainable Development of the Region in the Context of Digital Transformation” (Ivanovo, 2025). The research results and recommendations have been accepted for practical implementation by the Center for Research and Development of Unmanned Transport at the Directorate of Information Technology Systems and Communication Systems of the State Unitary Enterprise “Moscow Metro”; and by the Ivanovo Branch of the Plekhanov Russian University of Economics for use in the educational process within the framework of the “Project Management” course.

Publications. Based on the materials of the dissertation research, 16 scientific papers have been published, including 7 articles in journals recommended by the Higher Attestation Commission of the Russian Federation, 1 textbook, and 1 collective monograph. The total volume of published materials authored by the author is 10.93 printed pages.

Articles in publications included in the List of Publications Recommended by the Higher Attestation Commission of Russia for the

publication of the main scientific results of a dissertation for the degree of Candidate of Sciences.

1. Malov M. S. Retrospective analysis and trends in the development of economic and mathematical methods for assessing efficiency in applied economic tasks // Innovations and Investments. –2024. – No. 2. – Pp. 394-397. – ISSN: 2307-180X.

2. Malov M. S., Kislyakov A. N., Malova I. V. Methodological Foundations of Innovative Infrastructure Projects in the Transport Sector and Their Relationship with Efficiency // Innovations and Investments. – 2025. – No. 5. – Pp. 26–29.

3. Malov M. S., Kislyakov A. N. Quality and Economic Efficiency Management of Innovative Infrastructure Projects in the Public Transport Sector // Financial Markets and Banks. – 2026. – No. 4. – Pp. 615–618.

Articles in publications recommended by the Academic Council of the Academy

4. Malov M. S. Improving the efficiency of project management in the transport sector: methods and control parameters // Society: Politics, Economics, Law. – 2024. – No. 11 (136). – Pp. 148–154. – ISSN: 2071–9701. –DOI: 10.24158/pep.2024.11.19

5. Malov M.S. The Deming Cycle as the Basis for Managing the System of Indicators of the Economic Efficiency of Infrastructure Transport Projects // Vestnik evraziyskoy nauki. – 2024. – Vol. 16. – No. 5. – Pp. 394-397. – ISSN 2588–0101.

6. Kislyakov A.N., Tikhonyuk N.E., Malov M.S. Tools for Building Models of Spatial Development of Transport Infrastructure in Geomarketing Research // Management Consulting. – 2025. – No. 2 (188). – Pp. 46-56. – ISSN 1726-1139

7. Malov M. S. Economic Efficiency of Innovative Infrastructure Projects in the Transport Sector and Methodological Support for Its Management // Economic Development of Russia. –2025. – No. 4. – Pp. 134-138. – ISSN: 2306–5001

The author's other works

8. Kislyakov A. N., Malov M. S. Integration of economic and mathematical methods and models for assessing the effectiveness of infrastructure projects in the transport sector // Strategic Development in Conditions of Uncertainty: Proceedings of the 21st Scientific-Practical Conference on Problems of Strategic Management, November 17, 2023 / Edited by A. E. Illarionov. – Vladimir: Vladimir Branch of RANEPa, 2024. – Pp. 54–61. – ISBN 978-5-907789-03-6.

9. Malov M. The role of infrastructure transportation projects in the development of regional economy // Socio-economic development of the regions of Russia: trends, problems, prospects. Collection of scientific papers based on the materials of the V All-Russian scientific and practical conference, November 20, 2024. – Volgograd: LLC “Sphere”, 2024. – Pp. 155–160. – ISBN 978-5-00186-190-4.

10. Malov M. S. An innovative approach in transport infrastructure projects as a potential for enhancing the efficiency of the regional economy // Current problems of management, economics and economic security. Collection of materials of the VI International Scientific Conference, Kostanay, November 11–12, 2024 – Cheboksary: Sreda Publishing House, 2024. – Pp. 138–141.– DOI: 10.31483/r-113490

11. Malov M.S. The ecosystem approach in transport infrastructure projects as the basis for classifying factors influencing their economic efficiency // In the book: Principles of Building a New Ecosystem: Economic, Legal, and Social Aspects: a monograph / Danilchenko S.L., Sudakova N.E., Kurdyumov A.V., Gromova N.S., Kruglov V.N., Malov M.S., et al.; editor-in-chief E.V. Fomin; Chuvash State Institute of Culture and Arts. – Cheboksary: Publishing House Sreda, 2024. – Pp. 113–124.– ISBN 978-5-907830-75-2.

12. Malov M. Efficiency of transport infrastructure as a way to equalize socio-economic development of regions /Milliy iqtisodiyotni isloh qilish va barqaror rivojlantirish istiqbollari. MATERIALLAR TO ‘PLAMI mavzusidagi xalqaro ilmiy-amaliy konferensiyasi, Toshkent, 2024-yil 24-oktyabr –Toshkent:

«IMPRESS MEDIA» MCHJ, 2024. – C. 580 - 583. – URL: <https://inlibrary.uz/index.php/dev-national-economy/article/view/58713>

13. Malov M. S., Malova I. V. Project Management: a textbook / I. V. Malova, M. S. Malov. – Cheboksary: Sreda Publishing House, 2025. – 120 p. – 1 CD-ROM. – Title from the title screen. – Text: electronic. – ISBN 978-5-907965-29-4

14. Malov M.S. Digital tools for improving the efficiency of infrastructure projects in the transport sector // Economics and sustainable development of the region in the context of digital transformation. Collection of materials of the All-Russian scientific and practical conference of teachers, postgraduate students, and master's students of the Ivanovo branch of the Plekhanov Russian University of Economics, Ivanovo, April 17–18, 2025. – Ivanovo. – 2025. – Pp. 247–250. – ISBN 978-5-6053496-7-9

15. Malov M., Malova I. Digital transformation projects of transport infrastructure and the efficiency of their use // Problems and prospects for the development of the economy and education in Mongolia and Russia in the context of the growing influence of artificial intelligence and the digital economy. Collection of materials from the International Scientific and Practical Conference. Cheboksary. – 2025. – Pp. 117–123

16. Malov M.S. Problems and Prospects of Innovative Public Transport Development Projects for the Economy of Russian Regions // The Economy of Russia in the Context of Modern Challenges. Collection of Materials of the International Scientific and Practical Conference. Cheboksary. –2026. – Pp. 81-85.

The structure of the work. The work consists of an introduction, 3 chapters, a conclusion, and a list of sources used, which includes 243 items, including 17 in a foreign language. The dissertation contains 14 figures, 64 tables, 77 formulas, and 33 appendices. The content of the dissertation research is presented on 231 pages.