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Belomestnov, I. V. Improving the economic tools for assessing the transport and logistics infrastructure of the border region. Abstract of Ph.D. (Economics) thesis [Sovershenstvovanie ekonomicheskogo instrumentariya otsenki transportno-logisticheskoi infrastruktury prigranichnogo regiona. Avtoref. dis...kand. ekon.nauk]. Novosibirsk, SGUPS publ., 2024, 24 p.

The processes of transformation of economic systems, intensively occurring in recent years, affected the transport and logistics infrastructure of Russia and its regions. The main elements of the transport and logistics infrastructure (TLI) are the transport infrastructure itself, terminals and warehouses, information systems and transport and logistics centers.

Modern TLI is continuously linked to the trends in development of international trade, which is an integral part of state policy. The change in the direction of transport flows from west to east revealed a problem of discrepancy between the transport capacity of the eastern border regions and an increase in the economy's need for transportation in this direction.

The purpose of the study was to improve scientific and methodological approaches and economic management tools that assess the prospects for development of the transport and logistics infrastructure of the border region.

General economic and regional-specific factors, as well as social and technological processes were systematised that determine the need for strategic changes in the transport capacity and transport infrastructure of border regions as part of adaptation to the strategic transformation of economic systems. The influence of these factors on development

processes taking place in the transport and logistics infrastructure is revealed.

The methods of economic assessment of development of transport and logistics infrastructure have been improved based on a comparative approach.

The concept of transport and logistics barriers as a set of obstacles and advantages in organising international transportation has been clarified and supplemented, their impact on the strategy for development of transport and logistics infrastructure has been determined, a procedure for managing transport and logistics barriers has been developed based on identifying and modelling relationships with stakeholders.

Based on experimental studies, a process approach to development of transport and logistics infrastructure has been supplemented and tested, a process model of traffic flows has been formed, a system for considering the time factor in determining the economic effect of TLI modernisation has been proposed.

A model for organising an effective digital environment for the functioning of transport and logistics infrastructure has been proposed and tested.

The results obtained can serve as a basis for further development of research in the field of the efficiency of transport and logistics infrastructure in such areas as localisation and optimisation of transport and logistics barriers, development of integrated regional development projects.

5.2.3. – Regional and sectoral economics (transport and logistics).

The work was performed and defended at Siberian Transport University.

Chechelitsky, A. I. Track maintenance system in the presence of long irregularities in the longitudinal profile in areas of maximum traction and electrodynamic braking. Abstract of Ph.D. (Eng) thesis [Sistema tekhnicheskogo obsluzhivaniya puti pri nalichii dlinnykh nerovnostei prodolnogo profilya na uchastkakh maksimalnoi tyagi i elektrodinamicheskogo tormozheniya. Avtoref. dis. kand. tekhn. nauk]. Moscow, RUT publ., 2024, 24 p.

The development of railway transport is inextricably linked to the increase in train speeds, axle loads and the weight of cargo trains. Retrospective analysis shows that since the



beginning of the third millennium alone, the average train weight has increased by 20 %, and axle loads have grown by 26 %.

The objective of the study was to develop a scientifically sound system for assessing the impact of long track irregularities and their combination with short irregularities on safety of train traffic and track condition management in the presence of such faults.

Based on the results of the thesis, the scientific research on the causes of long profile irregularities and their impact on the dynamics of rolling stock, on intensity of fault accumulation and, consequently, on safety of the transportation process was summarised.

The parameters of long irregularities on the road network of JSC Russian Railways under various operating conditions were systematised, they were within the length range from 25 to 200 m, and within amplitude from 22 to 164 mm.

The possibility of using generalised models for assessing the influence of long unevenness on the indicators of interaction of the track and rolling stock for various variants of the influence of longitudinal forces has been proven.

The influence of longitudinal traction forces and electrodynamic braking of trains on the dynamic performance of rolling stock in the presence of long irregularities in the longitudinal profile of the track has been studied.

It has been proven that the most unfavourable effect on the performance of rolling stock dynamics is caused by combinations of irregularities in areas of maximum traction and electrodynamic braking.

A new concept has been introduced into the system of track maintenance management, i.e. immediate elimination of combinations of long irregularities with 3rd degree subsidence and 2nd degree which is close to 3rd degree.

A technology has been developed for eliminating long irregularities and their combinations with short irregularities to ensure safe train movement.

A scientifically based system has been developed for track maintenance management in the presence of long irregularities in the longitudinal profile in areas of maximum traction and electrodynamic braking.

The prospects for optimising the track maintenance system on heavy-duty sections with long irregularities formed due to insufficient bearing capacity of the subgrade been determined.

Proposals for changing the track maintenance standards and the procedure for performing works on the parameters of long irregularities

and their combinations with short irregularities for conducting operational testing have been developed and approved by the order of JSC Russian Railways dated 30.11.2023 No. 1322.

It is recommended to use the developed track maintenance system as a standard one in the presence of long irregularity of the longitudinal profile in areas of maximum traction and electrodynamic braking.

The prospect for further development of the topic is to determine the parameters of long irregularities and the rate of their development based on the track force loading value and the characteristics of the foundation soils.

2.9.2. – Railway track, survey and design of railways.

The work was performed and defended at Russian University of Transport.

Goryanskaya, I. V. Improving the efficiency of a transport company based on rational resource provision of transportation activities. Abstract of Ph.D. (Economics) thesis [Povyshenie effektivnosti raboty transportnoi kompanii na osnove ratsionalnogo resursnogo obespecheniya perevozochnykh vidov deyatel'nosti. Avtoref. dis...kand.ekon.nauk]. Moscow, RUT publ., 2024, 24 p.

The efficiency of any enterprise depends on the rational and justified use of all types of resources. Balanced provision of resources acquires priority importance in achieving a competitive advantage in reducing costs. Increased competition in the transport market requires transport companies to search for new approaches to sustainable economic growth. One of the mechanisms for increasing the efficiency of a transport company is rational resource provision, which allows optimising the cost of transportation, guarantees higher profits and lower costs than other market participants.

The objective of the thesis research was to develop a methodological tool for managing resource provision and assessing the impact of factors of rational use of resources on the efficiency of transportation activities of a transport company.

The factors influencing the development of a competitive advantage of dominance through costs and sustainable economic growth of transport companies have been studied. A methodological tool for calculating the total economic effect when

using the competitive strategy of «dominance through costs» is proposed. The use of this model will identify critical factors leading to an increase in the cost of transportation, reduce costs and improve the quality of the company's cost planning. The results of the calculations showed that the total economic effect of the proposed approaches to resource supply management can be from 3 % to 15 % of the cost optimisation of transportation activities of a transport company.

Various approaches to resource management that do not imply additional financial resources have been analysed. A predictive tool for calculating the costs of the main types of resources purchased by a transport company to carry out transportation activities is proposed, considering various scenario conditions, which will reduce the risks of exceeding resource costs above planned values and increase the efficiency of resource supply.

The impact of the prices of purchased fuel and energy and metal-intensive resources on the costs of a transport company has been analysed.

Based on the results of the analysis, a procedure for adjusting the planned price of material-intensive resources was developed, applied when price indicators exceed threshold values, which will ensure resource parity of participants in the resource supply process. The application of the proposed procedure will allow for timely determination of the need to adjust the price of key resources within the corridor of limit values (range of threshold coefficients), which will balance the benefits and risks of both parties to the contract, and support manufacturers in case of a negative situation on the raw materials markets.

Various approaches to assessing the impact of resource factors on the costs of a transport company for transportation activities were studied. Based on the analysis, a toolkit was proposed that allows identifying costly and risky purchases of resources that have a significant impact on costs and performing their quantitative assessment.

It is proposed to use the results of this assessment both to form planned parameters and to predict possible risks that will be considered when making management decisions.

A model was developed for assessing the impact of raw material component prices on changes in the cost of metal-intensive products purchased by a transport company to ensure the transportation process.

Methods for planning efficient resource supply based on the parity benefit of the buyer (transport company) and the manufacturer of the products have been developed.

The prospect of further development of the topic is improvement of the mechanism for forming forecast prices using price parity tools, since the problem of unplanned growth in the costs of transport companies for acquisition of metal-intensive products and fuel and energy resources is associated with the rise in the cost of raw materials.

5.2.3. – Regional and sectoral economics (transport and logistics).

The work was performed and defended at Russian University of Transport.

Ksenofontova, V. A. Modelling of physical properties and processes of transportation of viscous oil products under conditions of changes in temperature regime of the external environment. Abstract of Ph.D. (Eng) thesis [Modelirovanie fizicheskikh svoystv i protsessov perevozki vyazkikh nefteproduktov v usloviyakh izmeneniya temperaturnogo rezhima vneshnei sredy. Avtoref. dis...kand.tekh.nauk]. St.Petersburg, PSTU publ., 2024, 20 p.

Viscous oil products (VOP) account for a significant volume of cargo transportation in the Russian Federation, having low profitability. This fact can be explained by the physical and operational properties of the oil product during cooling: during transportation, VOP cools down, passing into a highly viscous state. Their unloading without prolonged and intensive heating, which requires additional time and resources, becomes impossible. At the same time, a distinctive feature of all viscous oil products is low thermal conductivity and a large value of volumetric thermal expansion.

The objective of the work was to improve the efficiency of the process of transportation of viscous oil products in winter (that is, reducing resource costs and duration of transport operations for transportation of VOP).

The application of the proposed numerical method for calculating the temperature distribution in a variable-thickness fuel oil layer during its heating (washout) allowed obtaining the method for a convex-concave segment.

A methodology for constructing mathematical models of the delivery process based on time stochastic Petri nets has been developed.



A statistical simulation model has been developed that allows determining a rational option for transporting high-viscosity oil products in winter conditions to improve the efficiency of both the entire transportation process and individual subprocesses, implemented using a set of programs using the Russian Business Studio platform.

The non-standard application of the Russian Business Studio platform, designed for modelling production business processes, allowed us to obtain estimates of the economic effect of the proposed method for transporting viscous oil products. As a result of the simulation modelling, we found that the capacity of one washing and steaming station can be increased by 3,4 times when cleaning the boiler of a tank car from highly viscous fuel oil residues; with the circulation method of draining the VOP, the consumption of steam and electricity is reduced by 37 % and 32 %, respectively, the unloading time is reduced by 4 % of car-hours (the testing period is one and a half years); the number of train turns during the winter period almost doubles.

The adequacy of the constructed models for the model of circulation draining of M-100 fuel oil is shown by comparing the results obtained during the simulation and the data provided by the operating organisation.

For the rest, the simulation data were compared with the results obtained analytically.

A promising direction for further research is generalisation of the mathematical model of transportation for any types of products with changing properties (general model).

1.2.2 – Mathematical modelling, numerical methods and software packages.

The work was performed and defended at Emperor Alexander I St. Petersburg State Transport University.

Kuzmin, V. R. Methodological approach, algorithms and programs for assessing environmental pollution by energy facilities. Abstract of Ph.D. (Eng) thesis [Metodicheskiy podkhod, algoritmy i programmy dlya otsenki zagryazneniya okruzhayushchei sredy obektami energetiki. Avtoref. dis...kand.tekh.nauk]. Irkutsk, ISTU publ., 2023, 19 p.

According to the Energy Strategy of the Russian Federation for the period up to 2035, the priorities of the state energy policy comprise the transition to environmentally friendly and

resource-saving energy, as well as rational use of natural resources and energy efficiency.

The objective of the work was to develop a methodological approach, algorithms and programs for assessing environmental pollution by energy facilities and supporting decision-making to reduce their harmful impact, based on the use of the author's information and computing system (ICS).

A methodological approach, algorithms and WICS ICS have been developed to assess environmental pollution by energy facilities and support decision-making to reduce their harmful impact.

The analysis of existing methods and models for assessing environmental pollution by energy facilities and approaches to constructing ICS has been performed.

A methodological approach to assessing environmental pollution by energy facilities is proposed, characterised by integration of disparate methods and the use of semantic technologies within the framework of the author's ICS and including a system of ontologies integrating ontologies of energy facilities and ontologies of the impact of energy facilities on the environment; principles of integrating methods for calculating emissions and the spread of pollutants; algorithms for calculating emissions and the spread of pollutants and an original algorithm for post-processing the results of calculating the spread of pollutants; a method for assessing the economic damage from environmental pollution by energy facilities.

A formalised model of ICS and a methodology for designing the ICS based on the agent-service approach are proposed, characterised by the use of event models to describe agent scenarios and the use of ontologies for designing databases. On its basis, an agent-service architecture was developed and a software implementation of the WICS ICS, a knowledge base storing the ontology system, and the implementation of databases of emissions of harmful substances from energy facilities (DB PEF) and snow survey results (DB SMP) were carried out.

A technology for assessing environmental pollution by energy facilities has been developed based on the proposed methodological approach and the ICS WICS.

Using the developed technology and tools, studies have been carried out based on a series

of computational experiments, the results of which show their applicability for preparing technical solutions adopted during creation and operation of energy facilities.

The results of the computational experiments have been interpreted and with the account for them, recommendations have been formulated for measures to reduce the negative impact of existing energy facilities on the environment. For the proposed recommendations, an assessment of their effectiveness was made for case of their implementation: the impact on reducing the volume of pollutant emissions and reducing the economic damage caused to the atmosphere.

The results of the thesis work have been applied in implementation of projects under the state assignment of the ISEM SB RAS, and of projects supported by grants from Russian (RFBR and RSF) and international (EAPI) scientific foundations and transferred to the Institute of Energy of the National Academy of Sciences of Belarus

2.3.1 – System analysis, information management and processing, statistics.

The work was performed at Federal State Budgetary Scientific Institution L. A. Melentyev Institute of Energy Systems of the Siberian Branch of the Russian Academy of Sciences (IEMS SB RAS) and defended at Irkutsk State Transport University.

Pletnev, D. S. On-board energy storage device on electric rolling stock of the metro. Abstract of Ph.D. (Eng) thesis [Bortovoi nakopitel energii na elektropodvizhnom sostave metropolitena. Avtoref. dis...kand. tekhn. nauk]. Moscow, RUT publ., 2024, 24 p.

All developed countries comply with global agreements on green energy and promote the careful use of natural resources. This is expressed in adoption of various government programs on resource and energy saving. One of the sectors of the economy where this is clearly expressed is the electric power industry, and within it – the power supply of electric transport

The objectives of the thesis were to study the efficiency of introducing energy storage devices on electric rolling stock of the metro, to develop technical solutions and to find ways of practical implementation of on-board energy storage devices as part of the electrical equipment of the electric rolling stock.

The main criteria for assessing the efficiency of using an energy storage device on board an electric rolling stock of the metro were identified.

The analysis of existing types of energy storage devices was carried out resulted in outlining the most suitable ones for use on the electric rolling stock of the metro.

Foundations for ensuring energy savings and improving safety of electric rolling stock movement were developed, differing from existing theoretical solutions by introduction of an on-board storage device on the electric rolling stock.

Experimental measurements of the electric rolling stock performance indicators were conducted on two Moscow metro lines, which resulted in obtaining real data on the power consumption for inter-train exchange and excess recuperation energy.

A digital model of operation of electric rolling stock in the structure of the traction power supply system of a Moscow Metro line was created.

A methodology has been developed and the results of the conducted simulation modelling of train movement have been compared with the results of experimental measurements of the parameters of the electric rolling stock movement on the Moscow metro line using integral indicators, the method of probabilistic analysis using the logistic distribution law, and the Student's criterion. The convergence of the results has been proven.

A program has been developed for statistical analysis of the electrical parameters of the train. An additional program module has been developed to determine the number of recharge cycles and the energy capacity of the on-board energy storage device.

A structural diagram and design of the energy storage device for use on board the electric rolling stock have been developed. The main characteristics of the on-board energy storage device have been determined. During an instrumental inspection of the undercarriage space, free space for placing the on-board energy storage device was determined.

The energy capacity of the energy storage device on the rolling stock has been determined using technical and economic parameters.

A methodology has been developed and a technical and electrical engineering assessment of the effect of using the energy storage device on board the electric rolling stock of the metro



under modern operating conditions has been made. It is recommended to introduce on-board energy storage devices on electric rolling stock of metro systems to improve the energy efficiency of train traffic, as well as to ensure additional safety for passengers during emergency stops of traffic associated with interruption of power supply from the traction power supply system, due to implementation of the autonomous running function.

NEW BOOKS ON TRANSPORT AND TRANSPORTATION

The list of original titles in Russian is published in the first part of the issue

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Abankina, I., Abdullaev, A., Andreeva, A. [et al.]. Cities of the Russian Federation. Urban Economy for Practitioners: Textbook [Goroda RF. Gorodskaya ekonomika dlya praktikov: Uchebnik]. Moscow, Prosveshchenie publ., 2024, 525 p. ISBN 978-5-09-118122-7.

Abdurakhmanov, K. Kh., Abuzarov, M. I., Antonov, V. G. Business Ecosystem Management: in two books [Upravlenie biznes-ekosistemami: v dvukh knigakh]. Ed. by Academician of the Academy of Sciences of the Republic of Uzbekistan, Doctor of Economics, Professor K. Kh. Abdurakhmanov. Book 2. Moscow, Plekhanov Russian University of Economics, 2024, 213 p. ISBN 978-5-7307-2094-7.

Afanasyev, M. P., Shash, N. N. Sustainable finance: Study guide. Moscow, Dashkov and Co., 2024, 223 p. ISBN 978-5-394-05868-4.

Bazhutova, E. A., Dyagileva, E. V., Korchak, E. A. [et al.]. System and modern problems, risks, opportunities for economic development of the Russian Arctic: Monograph [Sistemnye i sovremennye problem, riski, vozmozhnosti ekonomicheskogo razvitiya rossiiskoi Arktiki: Monografiya]. Ed. by T. P. Skufina, N. A. Serova. Apatity, Publishing house of Kola Science Center, 2024, 222 p. ISBN 978-5-91137-508-9.

Blau, S. L., Khomutova, E. V. Insurance of foreign economic activity: Textbook [Strakhovanie vneshneekonomicheskoi deyatel'nosti: Uchebnik]. Moscow, Dashkov and Co., 2024, 212 p. ISBN 978-5-394-05536-2.

Ganchenko, O. I., Petrova, E. V., Anastasov, M. S. Transport statistics [Statistika transporta]: Textbook for students of transport educational institutions Ed. by O. I. Ganchenko. 3rd ed., rev. and enl. Moscow, Finansy i statistika publ., 2024, 440 p. ISBN 978-5-00184-098-5.

Ginsky, V. V., Serga, L. K., Ionin, V. G. [et al.]. Statistics: Textbook [Statistika: Uchebnik]. Ed. by V. V. Ginsky. 5th ed., rev. and enl. Moscow, INFRA-M publ., 2024, 371 p. ISBN 978-5-16-018343-5.

Golubev, O. V. Railway track. Superstructure of the railway track. Calculations of the track gauge and a single ordinary turnout: Study guide [Zheleznodorozhnyi put. Verkhnee stroenie zheleznodorozhnogo puti. Raschety relsovoi kolei i odinochnogo obyknovennogo strelnochnogo perevoda: Ucheb. posobie]. Yekaterinburg, UrGUPS publ., 2024, 114 p. ISBN 978-5-94614-552-7.

The prospect of further work on the topic is development of methods for the automated selection of the capacity of the on-board energy storage device on electric rolling stock of the metro.

2.4.2. – *Electrical engineering complexes and systems.*

The work was performed and defended at Russian University of Transport. ●

Grigoriev, N. P., Klykov, M. S., Voprikov, A. V. [et al.]. Information modelling of traction load power supply schemes: Monograph [Informatsionnoe modelirovanie skhem pitaniya tyagovykh nagruzok: Monografiya]. Ed. by N. P. Grigoriev. Khabarovsk, FESTU Publishing House, 2024, 103 p. ISBN 978-5-262-00973-2.

Gruntov, A. V. Legal competence of a deck officer: Study-method. guide [Pravovaya kompetentsiya spetsialista komandnogo plavostava: Uchebno-metod. posobie]. Kaliningrad, BGARF Publishing House, 2024, 76 p. ISBN 978-5-7481-0550-7.

Karagodin, V. I. Maintenance and repair of automobile engines: Textbook [Tekhnicheskoe obsluzhivanie i remont avtomobilnykh dvigatelei: Uchebnik]. 3rd ed., ster. Moscow, Academia publ., 2024, 271 p. ISBN 978-5-0054-1805-0.

Latch, S. Yu., Chernysheva, O. B. Study of energy facilities: Study-method. Guide [Issledovanie energeticheskikh obektov: Ucheb.-metod.posobie]. St. Petersburg, GUAP publ., 2024, 95 p.

Nabokov, V. I. History of management thought: Textbook [Istoriya upravlencheskoi mysli: Uchebnik]. Moscow, Dashkov and Co., 2024, 273 p. ISBN 978-5-394-05515-7.

Savin, A. V., Solomatin, E. V., Korolev, V. V., Shishkina, I. V. Elements of ballastless track: Study guide [Elementy bezballastnogo puti: Ucheb. posobie]. RUT (MIIT), Moscow, Pero publ., 2024, 132 p. ISBN 978-5-00244-111-2.

Sinityna, A. S., Nekrasov, A. G., Konareva, N. A. [et al.]. Customer-focused transport and logistics systems and technologies: Study guide [Klientoorientirovannye transportno-logisticheskie sistemy i tekhnologii: Ucheb. posobie]. 2nd ed. Moscow, IPR Media publ., 2024, 171 p. ISBN 978-5-4497-2321-5.

Titov, S. A., Linder, N. V., Trachuk, A. V. [et al.]. Managing digital business transformation: concepts, cases, methods and tools: Monograph [Upravlenie tsifrovoy transformatsiei biznesa: kontseptsii, keisy, metody i instrument: Monografiya]. Moscow, INFRA-M publ., 2024, 222 p. ISBN 978-5-16-018697-9.

Zakirova, A. R. Methodology for professional risk management in the energy complex of railway transport: Monograph. Yekaterinburg, UrGUPS publ., 2024, 168 p. ISBN 978-5-94614-538-1.

Zarenbin, V. G., Chainov, N. D., Russinkovsky, S. Yu., Vallejo Maldonado, P. R. Modelling of the thermal state and calculation of friction pair seizure of basic heat-stressed parts of piston engines: Monograph [Modelirovanie teplovogo sostoyaniya i raschet na zaedanie par treniya bazovykh teplonapryazhennykh detalei porshnevnykh dvigatelei: Monografiya]. Ed. by D.Sc. (Eng.) N. D. Chainov. Moscow, INFRA-M publ., 2024, 221 p. ISBN 978-5-16-019033-4.

Zuev, S. M., Yakhutl, D. R., Bass, B. A., Maleev, R. A. Devices for ignition of the fuel-air mixture of heat engines: Study guide [Ustroistva vosplamneniya toplivovozdushnoi smesi teplovykh dvigatelei: Ucheb. posobie]. Ed. by S. M. Zuev. Moscow, INFRA-M publ., 2024, 181 p. ISBN 978-5-16-018125-7.

Compiled by Natalia OLEYNIK ●