

## **Study of Advantages and Disadvantages of Transport Innovations and Forms of Their Commercialization**

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### **Abstract**

The report presents the results of the study of modern directions of innovative development of transport technologies. It is proved that innovative solutions in the transport sector contribute to reducing costs, increasing the efficiency of transportation, reducing the environmental impact and improving the quality of service. technologies aimed at improving the safety, convenience and environmental sustainability of transport systems. Electric vehicles, alternative energy sources, drones (drones for transporting goods and passengers), intelligent transport systems, magnetic levitation, urban mobility and micromobility, autonomous transport (unmanned cars), and environmentally friendly transport solutions were identified as the object of the study. It has been identified that electric vehicles are key innovations in the modern transport sector, aimed at reducing the negative impact of transport on the environment and improving energy efficiency. Alternative energy sources for transport are also included in the scope of priority innovation areas in the transport sector. Their development is related to hydrogen fuel cells, which involve the use of hydrogen to generate electricity through a chemical reaction. For each of the identified priority innovative areas of development, advantages and disadvantages have been identified, as well as technical, technological and economic prerequisites for their further development have been formed. intelligence, the Internet of Things, big data, the development of "smart" transport. It is substantiated that the wide dissemination and further improvement of the results of innovation activity in the transport sector is closely related to the processes of commercialization of innovative technologies. It is proved that the commercialization of transport innovations involves the adaptation of new technologies for practical use in order to obtain economic benefits and increase the competitiveness of transport enterprises. The report proposes for practical use a list of forms and methods of commercialization of transport innovative technologies. It has been proved that in the field of transport provision, the most effective methods of commercialization of innovations will be models of licensing, franchising, joint venture, open commercialization, direct sale of transport services, startups and spin-offs, investment models, rental and subscription models. For each of the identified forms of commercialization of transport technologies, the conditions for their effective use and possible difficulties in the process of commercialization are determined and substantiated. The study of forms of commercialization is necessary for the successful introduction of transport innovations to the market.

**KEYWORDS:** *transport technologies; innovative activity; commercialization; forms; methods; advantages; disadvantages; development; efficiency*

### **1. Introduction**

At the present stage of development of the world economy, the transport industry plays a key role in ensuring the effective functioning of global markets, logistics and mobility of the population. Innovative solutions in the transport sector contribute to reducing costs, increasing transportation efficiency, reducing environmental impact and improving the quality of service. With rapid technological advancements, concepts such as electric vehicles, autonomous vehicles, hyperloops, delivery drones, and digital platforms for logistics management are transforming the transportation industry [4, 11, 14]. Commercialization of transport innovations involves the adaptation of new technologies for practical use in order to obtain economic benefits and increase the competitiveness of transport enterprises [2,9,13]. The study of forms of commercialization, such as licensing, franchising, venture financing, public-private partnerships, is necessary for the successful introduction of innovations to the market.

## 2. Study of Directions of Innovative Development of Transport Technologies

The innovative development of transport technologies is a key factor in modernizing global logistics, reducing environmental impact and increasing transportation efficiency. Current trends in the transport industry are focused on the development of new technologies aimed at improving the safety, convenience and environmental sustainability of transport systems (Fig. 1).

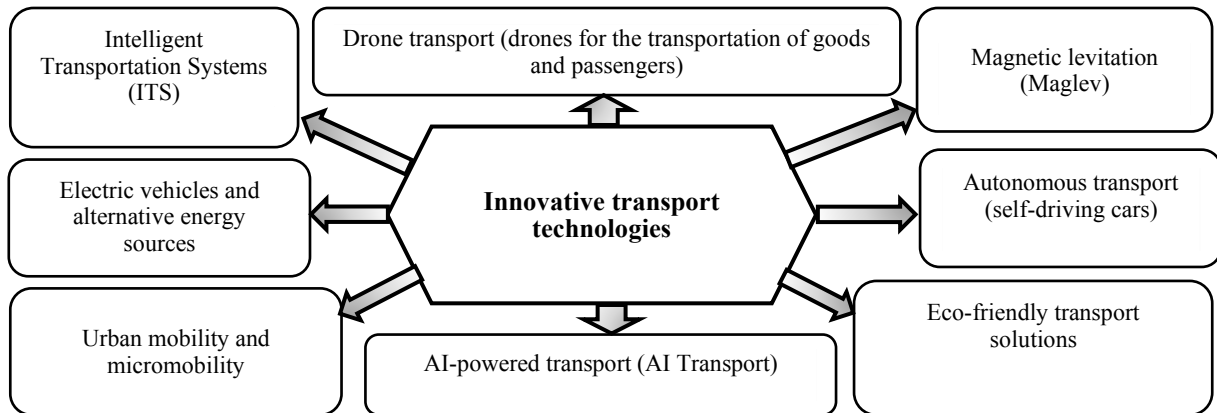


Fig. 1 Directions of innovation activity of transport enterprises. Source: author's development

*Electric vehicles* are key innovations in the modern transport sector, aimed at reducing the negative impact of transport on the environment and improving energy efficiency. An electric car is a vehicle that uses an electric motor and batteries instead of an internal combustion engine (ICE). Popular models of electric cars, in our opinion, today are Tesla Model S, X, 3, Y; Nissan Leaf; Hyundai Kona Electric; Porsche Taycan. The innovative development of this direction is associated with the presence of both significant advantages and individual disadvantages of electric vehicles [1, 5, 6, 12, 16].

Advantages of electric vehicles: environmental friendliness (no CO<sub>2</sub> emissions while driving); energy efficiency (the efficiency of the electric motor is much higher than that of the internal combustion engine); low operating costs (fewer parts requiring maintenance); reduction of noise pollution (almost silent operation of the engine). Disadvantages of electric vehicles: limited range (distance on a single charge depends on battery capacity); long charging time (depends on the type of charging station - standard, fast charging); cost (high price due to battery technology) [1, 6, 16].

*Alternative energy sources for transport* are also included in the scope of priority innovation areas in the transport industry. Their development is associated with hydrogen fuel cells (Hydrogen Fuel Cells), which involve the use of hydrogen for the production of electricity through a chemical reaction. This type of fuel is already used by such car brands as Toyota Mirai, Hyundai Nexo, providing them with a high range, fast refueling, limited by the high cost of hydrogen production, limited infrastructure. An interesting and quite promising technology is the use of solar energy (Solar Energy), which is used in the Lightyear 0, Aptera models and involves the installation of solar panels on the roofs of cars to recharge the battery. As a limitation, low efficiency in insufficient sunlight should be mentioned. Active scientific development is underway in the direction of creating biofuels for cars (Biofuels) [2, 16]. This technology involves the use of organic materials (vegetable oils, ethanol) as fuel. Important positive indicators of this type of fuel are renewability, lower CO<sub>2</sub> emissions compared to gasoline, and negative ones - the cultivation of raw materials can compete with the production of food crops.

The trends and prospects of these innovative technologies are related, in our opinion, to the development of charging station infrastructure, the spread of electric vehicles among budget models, the improvement of battery technologies (solid-state batteries), the integration of electric vehicles with renewable energy sources. An indisputable conclusion is the fact that electric vehicles and alternative energy sources are the key to a sustainable future of transport.

*Intelligent Transport Systems (ITS)* are modern transport management technologies that use artificial intelligence, sensors, communication networks and data analysis to improve the efficiency, safety and environmental friendliness of road traffic. Intelligent Transport Systems (ITS) are a set of technological solutions that integrate information technology, monitoring and control systems to optimize vehicle traffic [2, 6, 16]. ITS goals are: reducing congestion, improving traffic safety, reducing the negative impact on the environment, optimizing the use of infrastructure. The main components of ITS include: telecommunication systems (wireless networks such as Wi-Fi, 5G for data transmission between vehicles and infrastructure (for example, v2x (vehicle-to-everything) — data exchange between cars, traffic lights, pedestrians); data collection and analysis systems (sensors, video surveillance cameras, radars for traffic monitoring; real-time data analysis to predict traffic jams and accidents); intelligent traffic light control (adaptive traffic lights that change the duration of signals depending on traffic, such as smart traffic lights in Singapore); automated transport management systems (ATMS) that coordinate public transport, fixed-route taxis and trains; manage priorities for special vehicles (ambulances, police, fire departments); navigation and information systems.

The advantages of intelligent transport systems include safety: reduction of accidents due to warnings and automation; efficiency: optimization of movement, reduction of congestion; Sustainability: reducing CO<sub>2</sub> emissions by reducing congestion; Comfort: improving conditions for public transport passengers. Certain disadvantages include high

costs for infrastructure, data security and confidentiality, and the need for global standardization. Despite the individual challenges, intelligent transport systems are the future of transport, which is already changing the approach to mobility today.

*Drone transport* is an innovative technology that involves the use of unmanned aerial vehicles (drones) to transport goods and passengers. It opens up new opportunities for logistics, warfare, medical transportation and even urban transportation, reducing congestion and speeding up delivery. Drone transport is a system of autonomous or remotely controlled drones used for combat operations (widely used in the war between Russia and Ukraine), delivery of goods, transportation of passengers, medical transportation (donated blood, vaccines) [2, 5]. Today, there is a wide range of types of drones, among which it is necessary to highlight cargo drones, which are designed to transport small and medium-sized loads; used in logistics, in particular for express delivery of goods (for example, Amazon Prime Air - delivery of small parcels; passenger drones (air taxis); large drones for transporting people over short distances; how electric motors and vertical take-off and landing systems - VTOL are used (for example, Ehuang 216, Volo copter - fully autonomous air taxis); medical drones used for the rapid delivery of medicines, vaccines, donated blood (for example, Zipline - delivery of vaccines to remote regions of Africa).

The principle of operation of drone transport includes navigation: GPS, LiDAR and computer vision to determine the route; energy source: lithium-ion batteries or hybrid systems; Control: autonomous control through artificial intelligence systems or operators.

The advantages of drone transport, in our opinion, in most cases are associated with speed, since the delivery of goods is several times faster than traditional transport; environmental friendliness, as most drones run on electricity, reducing CO<sub>2</sub> emissions; accessibility, such as there is a real opportunity to deliver goods to hard-to-reach places; autonomy, since the minimization of the human factor is ensured due to automation. Difficulties in the development of drone transport are associated with the limited range of drones (limited range due to battery technologies; restrictions on flight safety in populated areas; there is a risk of collisions with other objects or interference with control; limited maximum weight of cargo (usually up to 5-10 kg). Drone transport is the future of fast, environmentally friendly and autonomous mobility.

*Artificial Intelligence-Based Transport (AI Transport)* is an innovative technology that uses artificial intelligence (AI) algorithms to control vehicles, optimize traffic, and improve safety [2, 5, 6, 16]. It is a key element in the development of smart cities and autonomous transport. AI Transport is a system that integrates machine learning algorithms, computer vision, big data analysis, and sensor technologies to drive autonomous cars, optimize traffic, predict congestion and accidents, and manage public transport.

The main areas of use of AI in transport include autonomous vehicles (Self-Driving Cars), which use AI for autonomous driving of a car without a driver (cameras, LiDAR, radars, GPS and powerful computing systems are already installed on Tesla Autopilot, Waymo, Cruise cars); intelligent transport systems that control traffic lights, regulate traffic in real time, analyze traffic flow, predict congestion and redirect traffic; logistics and fleet management in order to optimize delivery routes, predict arrival times, reduce fuel costs and downtime; aviation and rail transport, where automated flight control systems and monitoring the condition of trains are implemented, AI is used to prevent collisions and analyze the technical condition.

AI-based transport has important advantages associated with minimizing the human factor, reducing accidents; reducing congestion by analyzing traffic in real time; reduction of CO<sub>2</sub> emissions through effective traffic management; saving resources by optimizing delivery routes, which reduces fuel consumption. The difficulties in the development of this innovative direction are associated with the lack of uniform standards for regulating autonomous cars; with data confidentiality, since large amounts of personal data are processed; with the reliability of AI due to possible errors in critical situations, with the cost, since the price of introducing new technologies is quite high. We associate the prospects for the development of AI in transport with fully autonomous public transport, and AI integration with smart cities, improvement of accident prediction systems, the use of AI to control electric vehicles and charging stations. AI Transport is the key to the safe, efficient, and eco-friendly transportation of the future.

*Urban mobility and micromobility* are innovative transport concepts that aim to improve movement within cities, reduce congestion, improve the environmental situation and increase comfort for residents. Urban mobility is the use of compact personal vehicles to short trips (up to 10 km) [1, 2, 6]. Types of micromobility include bicycles and e-bikes, which are most often rented through bike-sharing services (for example, Next bike); electric scooters that are used for short city trips and rented through appropriate services (Bolt, Bird, Lime); electric skateboards and gyro boards, which are personal devices for short distances; car sharing in the form of renting a car for a short period of time through applications (Uklon, Bolt Drive); public transport as a consequence of the process of modernization of traditional transport: electric buses, trams, metro.

The advantages of urban mobility and micromobility, in our opinion, are reproduced in reducing congestion (fewer cars on the roads); environmental friendliness (less CO<sub>2</sub> emissions); savings (more affordable prices compared to a personal car); convenience (the ability to move quickly without the need to own a vehicle). The disadvantages are primarily related to safety, since there are no clear rules for electric scooters; with shortcomings infrastructure, since the need for bike paths and charging stations is not always satisfied; in the absence of uniform standards for the use of micro mobile transport. We associate the prospects for the development of this innovative direction in transport with its integration with smart cities (Smart Cities), as well as with a complete transition to electric transport and automation of micromobility (self-driving scooters and bicycles). Urban mobility and micromobility are a step towards the environmentally friendly, safe and comfortable transport of the future.

*Magnetic levitation technology (Maglev)* is an innovative transportation system that uses a magnetic field to lift and move trains without contact with the rails. This allows for a significant increase in speed, smoothness of movement and reduced wear and tear on infrastructure. Maglev (Magnetic Levitation) is based on the principles of magnetic interaction: levitation: the train rises above the rails due to the repulsion of magnets of the same polarity; Movement: Linear synchronous motor (LSM) creates a magnetic field that moves the train forward; Stabilization: Active magnetic control systems keep the train in a stable position. Today, there are several types of magnetic levitation: electromagnetic levitation (EMS) - uses electromagnets placed under the train (for example, Transrapid in Germany); electrodynamic levitation (EDS) - based on the use of superconducting magnets that create a repulsive field (e.g. JR-Maglev in Japan) [2, 6].

Advantages of Maglev technology: high speed that reaches 600 km/h (for example, the Japanese SCMaglev); smoothness of movement, since there is no friction between the wheels and rails; low noise level due to the lack of contact between rails and wheels; negligible need for maintenance, as there is minimal deterioration of the infrastructure; environmental friendliness - minimal CO<sub>2</sub> emissions due to electric power. The disadvantages of Maglev technology are associated with its high cost: the construction of Maglev lines is much more expensive than traditional railways; incompatibility with existing railway networks: there is a need for special tracks; high energy costs at high speeds [2, 6, 16]. Maglev is the technology of the future for ultra-fast and environmentally friendly transportation.

*Autonomous vehicles (self-driving cars)* are innovative transport technologies that use artificial intelligence (AI), sensors and navigation systems to control cars without direct driver intervention. environmental scanning; GPS and mapping systems for navigation; computer vision (Computer Vision) for object recognition.

Advantages of autonomous transport: the number of accidents is reduced due to the elimination of the human factor; traffic is optimized by reducing congestion due to the exchange of data between cars; the level of accessibility to transport is increasing, as there are expanding transport opportunities for people with disabilities; time saving: cars can work around the clock; high level of environmental friendliness, as most autonomous cars are electric vehicles. The shortcomings relate to legal issues (lack of uniform regulatory standards); data security (there is a need for reliable protection against hacker attacks); reliability of AI (errors in critical situations are not excluded; unresolved ethical dilemmas (how a car should act in collision situations). Autonomous transport is the future of safe, environmentally friendly and efficient transportation.

### 3. Forms of Commercialization of Transport Innovative Technologies

The formation of models of commercialization of transport technologies involves the creation of effective strategies for transforming scientific and technical developments and innovations in the transport industry into commercially successful products or services [8]. Forms of commercialization of transport innovative technologies are various ways in which innovations in the field of transport are introduced to the market and bring economic profit. They are aimed at transforming technological developments into real products, services or business models (Fig. 2).

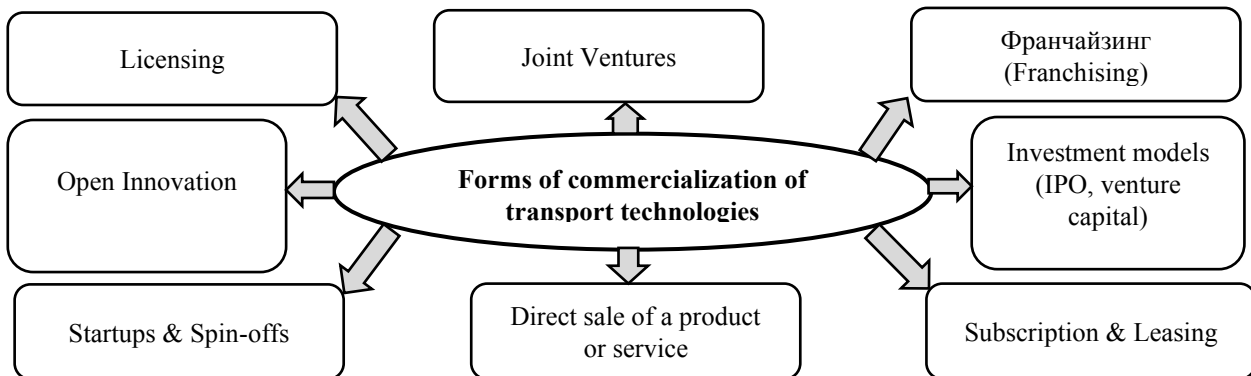


Fig. 2 Classification of forms of commercialization of transport technologies. Source: author's development

*Licensing* is one of the key forms of commercialization of innovative transport technologies, which involves the transfer of rights to use the technology to another party (licensee) for a certain fee or royalties, while retaining ownership rights with the developer (licensor). Licensing is a contractual form of cooperation in which the owner of an innovative transport technology (for example, autonomous control systems, new materials for vehicles or software) transfers the right to use this technology to a third party [4, 8, 9]. Advantages of licensing: a constant stream of profit in the form of royalties; the licensee can implement the technology in different countries; the owner does not bear production costs; control over the terms of use through a contract. Disadvantages of licensing: limited ability to influence the quality of the product; possible disputes regarding violation of the terms of the agreement; limited level of profit compared to independent production. Licensing is an effective way to commercialize innovative transport technologies, especially for companies that own unique developments, but do not plan to engage in their mass production.

*Joint ventures (JV)* are one of the effective forms of commercialization of transport innovative technologies, which involves combining the resources, experience and technologies of several companies for the joint development, implementation and commercial use of new transport solutions. Conditions of creation *JV* is joint management and

financing, exchange of intellectual property and know-how, sharing of profits and risks [4, 9, 14]. The main goals of creating joint ventures in the transport sector are: bringing innovative technologies to the market, sharing risks in the development of new products, access to new markets and customer base, joint research and development (R&D). Advantages of joint ventures: sharing resources and technologies, sharing risks, accelerating market entry, access to new markets. The disadvantages of joint ventures are the risk of conflicts, difficulties in distributing profits, legal complexity, and the risk of loss of intellectual property. Joint ventures (JVs) are an effective form of commercialization of transport innovations, especially for projects that require significant investment or pooling of expertise. They contribute to accelerating technological development, reducing risks and expanding market opportunities.

*Startups and spin-offs* are among the most dynamic forms of commercialization of innovative transport technologies. They aim to introduce new ideas, developments and technologies to the market by creating new companies or separating innovative divisions from existing enterprises. A startup is a newly established company that focuses on the development and commercialization of innovative transport technology. A spin-off is the separation of a division of a large company in order to commercialize a new transport technology. Advantages of startups and spin-offs: the introduction of new technologies, the ability to quickly adapt to the market, it is easier to raise funds for a promising idea, less bureaucracy than in large corporations [4, 14]. Disadvantages of startups and spin-offs: high risks (most startups do not succeed), financial instability (dependence on investors), difficulties in protecting intellectual property and licensing. Startups and spin-offs are key drivers of the development of transport innovations. They allow you to quickly implement new technologies, attract investments, and scale advanced solutions.

*Open commercialization of transport innovation technologies* is a modern approach to technology diffusion, which involves providing access to innovations for third-party companies, developers or even the public. The goal is to accelerate innovation, attract external partners and stimulate market development through collaboration. Open Innovation is a strategy in which a company shares its technological developments or provides access to them through open patents, free or licensed access to technologies, open-source code. The main idea is to attract external partners, startups, scientific institutions to improve or scale innovations [4, 13, 14]. Advantages of open commercialization: acceleration of implementation, new solutions due to the involvement of third-party experts, cost reduction (part of the R&D costs are borne by external participants), market expansion. Disadvantages of open commercialization: loss of competitive advantages due to possible copying, inability to control all aspects of the use of technology, the possibility of violating the terms of use of the technology. Open commercialization is a powerful tool for accelerating innovation in the transportation industry. It promotes global cooperation, market expansion and the involvement of new players in the development of technologies.

*Franchising* is an effective form of commercialization of innovative transport technologies, which involves the transfer of the right to use the business model, brand and technological solutions to another party (franchisee) under the terms of a license agreement. Franchising is a business model according to which the owner of an innovative transport technology (franchisor) transfers the right to a third-party company (franchisee). use technological solutions, equipment and software, service standards, marketing strategies, operational processes [7, 14]. Advantages of franchising in transport technologies: business expansion without significant own investments, access to innovations, risk reduction, marketing support. Disadvantages of franchising: limited ability to control the quality of service, the franchisee is obliged to pay royalties and down payment, in case of violation of standards by the franchisor, the reputation of the brand may suffer.

*Rentals and subscriptions* are modern forms of commercialization of innovative transport technologies, which involve providing consumers with access to vehicles or technologies on a temporary basis for a fixed fee [14]. Forms of lease in the transport sector: Short-term Leasing - short-term lease for private or commercial needs; financial lease (Long-term Leasing) - long-term lease with the possibility of further redemption; car sharing - daily or hourly car rental through mobile applications (for example, Bolt Drive, Uklon Carsharing). A subscription is a model in which a consumer gets access to a vehicle or service for a monthly fee with the possibility of regularly changing cars or services. Forms of subscription in the transport sector: car subscription - constant access to the car without purchasing it (Care by Volvo, Porsche Drive); micromobility subscription - unlimited access to electric scooters or bicycles (Bird One, LimePass); technical subscriptions - access to software for driving (for example, Tesla Full Self-Driving).

#### 4. Conclusions

As a result of the study, it was found that transport innovations play a key role in the formation of modern infrastructure and ensuring the sustainable development of cities and regions. The use of the latest technologies in the transport industry contributes to increasing the efficiency of transportation, reducing fuel consumption, improving the environmental situation and increasing the level of road safety. It is determined that the main advantages of transport innovations are: increasing the productivity of transportation through automation; reducing the impact of the human factor; reduction of transport operating costs; the ability to create new types of services (for example, mobility as a service — Maas); promoting the digital transformation of urban infrastructure.

At the same time, significant shortcomings that accompany the process of introducing innovations in transport were identified: high initial investment costs; complexity of legal regulation; lack of a national strategy for innovative development of transport; cybersecurity risks; the need to retrain personnel and adapt the population.

As for the forms of commercialization of transport innovations, the most effective were: public-private partnership, which allows distributing financial and institutional risks between the state and business; venture financing, which stimulates the development of startups in the field of mobility; licensing and franchising, which ensure the rapid

distribution of technologies; incubation programs to support innovative projects in the early stages. As a result, the effective implementation of transport innovations depends on an integrated approach that includes scientific support, legislative framework, financial mechanisms, and outreach activities. The future of the transport system is directly related to the level of innovation and readiness of society for change.

## References

1. **Alanazi, F.** 2023. Electric Vehicles: Benefits, Challenges, and Potential Solutions for Widespread Adaptation, *Appl. Sci.* 13: 6016. <https://doi.org/10.3390/app13106016>.
2. **Araghi, Y.; Wilmlink, I.** 2022. Innovations in transport. URL: [https://www.researchgate.net/publication/365610878\\_innovations\\_in\\_transport](https://www.researchgate.net/publication/365610878_innovations_in_transport)
3. **Chernyshenko, O.; Pererva, P.; Ponomarov, V.; Kobielieva, T.; Veresne, S.M.; Nagy, S.; Keršys, R.; Reichling, P.; Tkachova, N.; Tkachov, M.** 2025. Formation of production cost by the methods of “Target costing” and “Kaizen costing” and their impact on the enterprise efficiency, *Technology Audit and Production Reserves* 1(4(81)): 20-27. <http://doi.org/10.15587/2706-5448.2025.323949>
4. **Pererva, P.; Kosenko, O.; Kobieliev, O.; Havrys, V.; Matrosova, V.; Pohorielova, T.** 2024. Current State and Prospects of Economic Development of the Transport Industry in Ukraine, *Transport Means 2024: Proc. of the 28th Intern. Sci. Conf.*, 324-329. URI: <https://doi.org/10.5755/e01.2351-7034.2024.P324-329>
5. **Pererva, P.; Kobielieva, T.; Glisnuza, M.; Ievsieieva, O.; Doronina, M.; Kosenko, A.** 2024. Economic and Legal Problems of the Development of the Ukrainian Small Aviation Market and Ways to Solve Them, *Transport Means 2025: Proc. of the 28th Intern. Sci. Conf.*, 787-792. URI: <https://doi.org/10.5755/e01.2351-7034.2024.P787-792>
6. Electric Vehicle Benefits and Considerations. URL: [https://afdc.energy.gov/fuels/electricity\\_benefits.html](https://afdc.energy.gov/fuels/electricity_benefits.html).
7. **Ievsieiev, A.; Maslak, M.; Tkachov, M.; Tkachova, N.** 2024. Formation of intellectual property commercialization strategies, *Eastern-European Journal of Enterprise Technologies* 1(13(127)): 80-91. URL: <https://doi.org/10.15587/1729-4061.2024.296836>
8. **Kobieliev, V.; Maslak, M.; Maslak, O.; Kobielieva, A.** 2022. Intellectual and Innovative Directions of Improving the Market Characteristics of Asynchronous Electric Motors, 2022 IEEE 4th International Conference on Modern Electrical and Energy System (MEES), Kremenchuk, Ukraine: 1-6. URL: <https://doi.org/10.1109/MEES58014.2022.10005691>
9. **Maslak, M.** 2023. Formation of economic and legal measures for the development of the market of intellectual property objects, *Eastern-European Journal of Enterprise Technologies* 1(13(121)): 113-124. URL: <https://doi.org/10.15587/1729-4061.2023.273850>
10. **Maslak, M.; Nagy, S.; Kosenko, O.; Kobielieva, T.** 2024. Economic Assessment of Outsourcing of Intellectual and Information Technologies. In: *Semenov, A., Yepifanova, I., Kajanová, J. (eds) Data-Centric Business and Applications. Lecture Notes on Data Engineering and Communications Technologies*, vol 195. Springer, Cham. [online cit.: 2024-05-14]. URL: [https://doi.org/10.1007/978-3-031-54012-7\\_7](https://doi.org/10.1007/978-3-031-54012-7_7)
11. **Maslak, M.; Nagy, S.; Kosenko, O.; Kobielieva, T.** 2024. Economic Assessment of Outsourcing of Intellectual and Information Technologies. In: *Semenov, A., Yepifanova, I., Kajanová, J. (eds) Data-Centric Business and Applications. Lecture Notes on Data Engineering and Communications Technologies*, vol 195. Springer, Cham. [online cit.: 2024-05-14]. URL: [https://doi.org/10.1007/978-3-031-54012-7\\_7](https://doi.org/10.1007/978-3-031-54012-7_7)
12. **Maslak, M.; Yakovenko, Y.; Maslak, O.; Grishko, N.** 2022. Problems of Intellectual Property in the Information Economy Through the Prism of Artificial Intelligence as a Dual-Purpose Technology, 2022 IEEE 4th International Conference on Modern Electrical and Energy System (MEES), Kremenchuk, Ukraine: 01-05. URL: <https://doi.org/10.1109/MEES58014.2022.10005671>
13. **Nazarenko, S.; Maistro, R.; Danko, T.; Doronina, M.; Sokolova, L.** 2021. The formation of economic and marketing prospects for the development of the market of information services, *Eastern-European Journal of Enterprise Technologies* 6(13(114)): 6-16. URL: <https://doi.org/10.15587/1729-4061.2021.245251>
14. **Pererva, P.G.; Maslak, M.** 2022. Commercialization of intellectual property objects in industrial enterprises, *Problems and Perspectives in Management* 20(3): 465-477. [online cit.: 2024-05-14]. URL: [https://doi.org/10.21511/ppm.20\(3\).2022.37](https://doi.org/10.21511/ppm.20(3).2022.37)
15. **Pererva, P.; Marchuk, L.; Novik, I.; Dolyna, I.; Suslikov, S.; Maistro, R.** 2024. Study of the Theoretical and Methodological Essence of Transport Technologies, *Transport Means 2024: Proc. of the 28th Intern. Sci. Conf.*, 137-142. URI: <https://doi.org/10.5755/e01.2351-7034.2024.P137-142>
16. The environmental benefits of electric vehicles come in many forms. URL: <https://www.seai.ie/technologies/electric-vehicles/why-drive-electric/the-environment/>