

UKRAINE'S TRANSPORT INFRASTRUCTURE: STRATEGIC DEVELOPMENT AND ANALYSIS OF INDICATORS

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ABSTRACT

Transport as an infrastructure industry should ensure the timely and efficient transportation of goods and passengers, deepening Ukraine's integration into European and world economic systems. However, the unsatisfactory state of the existing different types of rolling stock transportation in Ukraine determines the low level of Ukraine's potential as a transit country, and therefore reduces the competitiveness of the economy. The transport system of Ukraine is developing with almost all types of land, water, air and pipeline modes of transport, but it lags far behind the development of the European system. The peculiarities of the transport infrastructure formation, character and influence on the development of the country are determined. The transport sector problems of the region and the ways of their solution according to the requirements of the tourist sector are explored. The absolute indicators and rates of departure (transportation) growth of passengers by modes of public transport for four types of transport: rail, automobile, and sea aviation transport in the period of 1980–2018 are analysed. The article focuses on the advantageous geographical location of Ukraine, the availability of direct road, air and water connections with the countries of the world, which needs the development of the relevant transport infrastructure and is attractive for domestic and foreign investors. Today, the reforms claimed by the authorities of Ukraine are happening, unfortunately, in the military aggression conditions of a neighbouring country. However, they apply to all areas of the national economy, create the basis for balanced development of the country, take into account the new infrastructure policy of the European Union, which aims to

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connect the transport systems of the European countries into a single Trans-European transport network.

Key words: strategic development, transport infrastructure, the Association Agreement, transit potential, rail, automobile, maritime aviation transport.

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1. Introduction

The Association Agreement between Ukraine and the European Union (Chapter 7. Transport) (Association Agreement ..., 2015) states that the Parties expand and strengthen cooperation in the transport sector, promote sustainable transportation systems development; intensify the implementation of effective, safe transportation and intermodality with interoperability of transport systems; make efforts to strengthen the major transport links between the territories of the Parties.

The cooperation covers the following areas (Fig. 1). The priority reforms in Ukraine have been identified in the medium-term plan of the Government's priority actions by 2020 (The Order of the Cabinet of Ministers of Ukraine..., 2017), in particular: decentralization and reform of public administration; ensuring accelerated economic development by improving the transfer pricing and application of indirect tax methods, automatic and transparent reimbursement of value added tax, transparent privatization of state enterprises; state investment policy; regulatory policy and business development, ensuring conditions of competition, support of exporters.

A special place in the economic development of the country is devoted to the sphere of transport infrastructure (The Order of the Cabinet of Ministers of Ukraine..., 2017).

Ukraine's joining to the European Aviation Area, attracting investments for the development of airport infrastructure, in particular through public-private partnership instruments; the completion of rail transport reform, efficient use of port infrastructure, the development of a network of international transport corridors and priority connections, the transfer of local roads to the management of local authorities, etc. is provided.

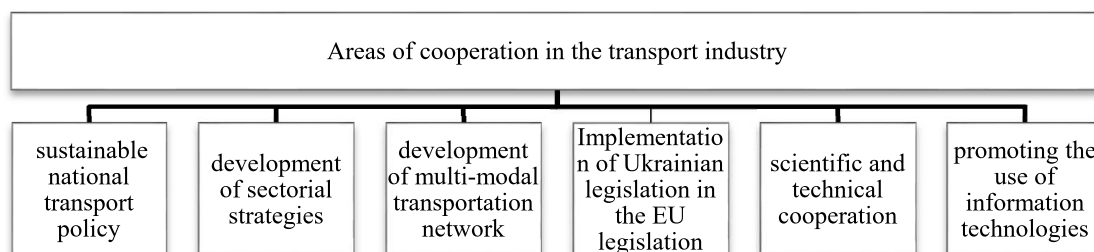


Figure 1. Areas of cooperation between Ukraine and the European Union in the transport sector

The National Transport Strategy of Ukraine for the period by 2030, approved in 2018 (The Order of the Cabinet of Ministers of Ukraine..., 2018) offers a comprehensive solution of existing problems in the transport sector, defines the development priorities in the context of the implementation of the European integration course and the implementation of the Association Agreement between Ukraine.

The main objective of the transport infrastructure in the tourism industry is to create a comprehensive environment for the free movement of tourists (service consumers) and their access to recreational resources and facilities. Tourism is closely connected with transport system through transport infrastructure. An important financial mechanism for reforming transport sector in Ukraine is the help of the EU, foreign banks and leading financial institutions that is provided in the form of budget support, loans for projects aimed at transport sector modernization.

Nowadays, transport sector does not meet the needs of national economy and population concerning transportation in general and tourism in particular. The levels of safety, passenger and freight transportation efficiency, energy conservation, man-induced impact on environment are contrary to modern demands.

Cooperation between Ukraine and the European Union should facilitate the restructuring and renewal of Ukraine transport sector and the gradual harmonization of existing standards and policies of the EU. Cooperation should also be directed to improve passengers and freight transportation, increase fluidity of traffic between Ukraine, the EU and third countries by removing administrative, technical, near-border and other barriers, improve transport network and infrastructure modernization, particularly on the main transport axes, which connect Ukraine and the EU.

Transport sector modernization in Ukraine has to ensure its compliance with European standards both in freight transportation speed and quality and in passenger service comfort. In such a case, measures, aimed at solving the demand and supply problem of transport services, intensifying international cooperation and strengthening the process of transport integration of Ukraine into the European and global transport networks, development of public-private partnership in the transport sector, should play an essential role.

The dimensions of the country, or a region, the processes of regional social and economic development determine the need for transport infrastructure optimization to the demands of the local population and consumers of tourism services.

Within the cooperation framework between Ukraine and the European Union and the Agreement on Free Trade (January 16, 2016), the first experimental freight train was sent from Ilyichivsk, Odessa region, that came to China in 16 days. Ukraine, Georgia, Azerbaijan, Kazakhstan, China and countries of the European

Union are connected to «the Milky Way». Particularly, in the beginning of February 2016 there was signed a preliminary memorandum with Lithuanian partners on the unification of a new «Milky Way» and involving cargo train «Viking» (Ilyichivsk – Minsk - Klaipeda) with the project «Great Silky Way» to China, bypassing Russia (Ukraine – Georgia – Azerbaijan – Kazakhstan – China) (Free Trade Area between Ukraine...).

2. Scientific research of transport infrastructure

The basis of the new EU infrastructure policy is the unification of the national transport systems of the European countries into a single Trans-European transport network centered on nine new transport corridors: the Baltic – Adriatic, the North Sea – the Baltic, the Mediterranean corridor, the Middle East corridor, Scandinavia – the Mediterranean sea, the Rhine – the Alps, the Atlantic Corridor, the North Sea – the Mediterranean Sea, the Rhine – the Danube. As a result of the implementation of this strategy by 2050, the updated transport network will connect 94 sea and river ports, 38 key airports and will allow to upgrade 15 thousand kilometers of railways, adjusting them for high-speed traffic (Mikhailichenko K. M., Yemelyanov O. Yu., Analytical note..., 2014).

Ukrainian scientists have been investigating the transport infrastructure in terms of economic development of the country and its movement towards European values during recent years.

Scientists at the Institute of Economic and Legal Studies of the National Academy of Sciences of Ukraine, Volodymyr Dahl East-Ukrainian National University, Kharkiv National Automobile and Road University have published a monograph “Infrastructure Provision for the Development of the Transport System of the Region” (Zablodska I., 2016). Dnipro scientists from the University of Customs and Finance have explored the directions and prospects for the development of transport and customs infrastructure in Ukraine (Pasichnik A. and others, 2016).

In the thesis on obtaining a scientific degree of the doctor of economic sciences, of V. Shemaeva a scientist at the National Institute for Strategic Studies, is determined the dual interconnection between the development of transport infrastructure and elements of state’s economic security system (Shemaev V., 2018).

A scientist and now the practice manager of the Ministry of Infrastructure of Ukraine I. Sadlovskaya defended scientific work for obtaining a scientific degree of the Doctor of Economics “Strategic management of the national transport infrastructure of Ukraine” (Sadlovskaya I., 2011) and continues to implement scientific research in the field of public administration in practice. Fundamental

scientific research of I. Pishenin is devoted to the strategic management of transport infrastructure of agribusiness enterprises in Ukraine. (Pishenin I., 2017):

The study of transport infrastructure in various areas of the national economy are to be considered perspective.

3. Economic analysis of indicators of dynamics

The transport industry in Ukraine is considered in the context of sub-sectors: automobile and urban transport, road economy, rail transport, water transport, air transport, postal communication. The central executive body, which forms and implements the state policy in the above-mentioned areas, is the Ministry of Infrastructure of Ukraine. The Regulation on the Ministry was approved in 2015 by the Resolution of the Cabinet of Ministers of Ukraine (Resolution of the Cabinet of Ministers of Ukraine ..., 2015).

The largest share (up to 40%) of passengers' transportation from all transport types in Ukraine is occupied by road transport (buses), where 2/3 of road transport passengers are transported in suburban traffic. Trolleybuses, subways and tram carriages of passengers obviously predominate in the city.

Significant share of passenger transportation is occupied by rail transport. The number of passengers carried in 2018 is over 200 million people. Ukraine has 105 train stations. Operating length of main roads is almost 20 thousand km.

Accelerated development is observed in the aviation industry. In 2018, the number of transported passengers amounted to more than 12 million people. The arrival of new companies in the air transport market creates conditions for the competitive environment and contributes to improving the quality of services provided. More than 50% of all passenger flights of Ukrainian airlines make international regular services. In 2018 regular international flights were carried out by 10 domestic airlines to 46 countries of the world.

Seaports are an integral part of the transport and industrial infrastructure of the state in view of their location in the directions of international transport corridors. The branch with one of the most powerful potential among the leading countries of the world: 38 state-owned enterprises with a turnover of about 10 billion UAH for a year (Official Website of The Ministry Ukraine Infrastructure).

According to the State Statistics Service (Official Website of The State Statistics Service of Ukraine), we made diagrams; rail, road, maritime, air passenger transportation analysis of 1980–2018 is also conducted (Fig.2).

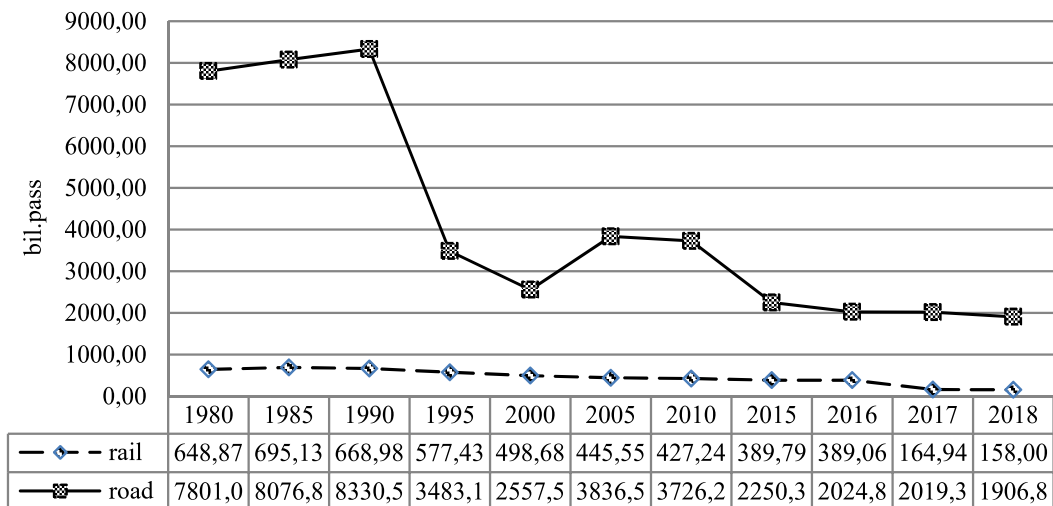


Figure 2. Road, rail passenger transportation in Ukraine, bil.pass., 1980–2018

Source: based on the (Official Website of The State Statistics Service of Ukraine, 2019; of The State Statistics Service of Ukraine, 2019).

Calculations for 2014–2018 were conducted without taking into account temporarily occupied territory of the Autonomous Republic of Crimea, Sevastopol and Anti-Terrorist Operation Zone. Since 2017 the procedure for recording the passenger transportation by suburban rail transport, which enjoy privileges for free travel, has been changed. The number of passengers departing from the data of PJSC "Ukrzaliznytsya" in 2017 and 2018 corresponds to the new procedure for registration of passengers. Indicators on passenger transportation by air transport since 2003 are published according to the data of the State Aviation Service of Ukraine.

We examined the dynamics of passenger traffic by breaking the period of official statistical observations for 5 years, starting from 1990. Taking into account the order of measurement of statistical indicators, we united on schedules of transportation by road and rail (Fig. 2), maritime and aviation (Fig. 3).

The decrease in the total transportation of passengers in Ukraine is connected, in particular, with the economic crises of the 1990's, the global economic crisis of 2008, the military invasion of Russian Federation into Ukraine (2014), with a decrease in the population (from 52244.1 million in 1993 to 45.4 million people as on January 1, 2014), aging of the population, which has no opportunity to travel because of the low financial capacity. Taking into account the temporarily occupied territories of Donetsk, Luhansk Oblasts and the Autonomous Republic of Crimea, the number of existing population on January 1, 2019 in Ukraine, according to the State Statistics Service (The population, 2019), amounted to 42.1 million people.

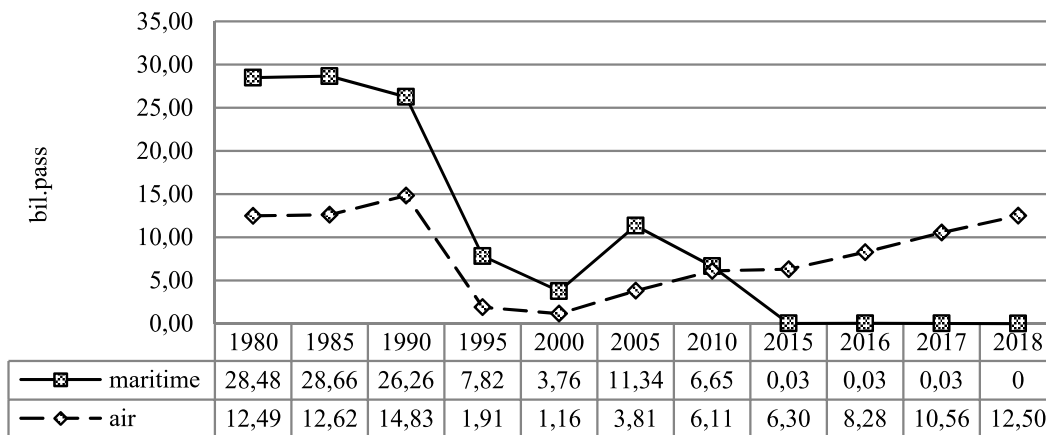


Figure 3. Maritime, air passenger transportation in Ukraine, bil. pass., 1980–2018

Source: based on the (Official Website of The State Statistics Service of Ukraine, 2019; of The State Statistics Service of Ukraine, 2019).

Transportation by road transport has decreased fourfold since 1980: from 7801.6 million people to 1906.8 million people in 2018. Transportation by rail transport since 1980 has decreased by 1.7 times: from 648.8 million people to 389.8 million people in 2016.

Dynamics of maritime, air passenger transportation in Ukraine during 1980–2018 is illustrated on Fig.3. Maritime transportation has significantly decreased since 1980: from 28.5 million people to 0.03 million people in 2017. The Russian Federation's annexation of the territory of Ukraine – the Autonomous Republic of Crimea and the city of Sevastopol – seriously threatens the security of the state and impedes the functioning of the maritime industry (Baryshnikova V.V., 2015). The occupation of five Ukrainian merchant ports in Crimea complicated the work of the maritime industry, in particular, ports located on the Azov Sea coast (Mariupol city and Berdyansk city). Ukraine has lost its powerful property complexes of the management companies of the Ministry of Infrastructure of Ukraine and the Ministry of Agrarian Policy and Food of Ukraine, which are located on the territory of the ARC.

Transportation by air transport has been changing from 12.49 million people in 1980 to 1.16 million people in 2000, after that the passenger traffic has been yearly gradually increasing and reached 12.5 million people in 2018. Thus, only in 2018, Ukraine went by the number of passenger transportation in the field of aviation to the level of 1980.

The following figure (Fig. 4) illustrates the growth rates of passengers' departure (transportation) by type of public transport, in % for four types of transport: rail, road, maritime aviation. We can see: a significant decrease in the volume of passenger transportation by all types of transport in 1990–2000,

a synchronous increase in the growth rate of three types of transport – rail, road, aircraft in the period of 2000–2005, their decline in the period of 2005–2010 and 2010–2015 and growth after 2015.

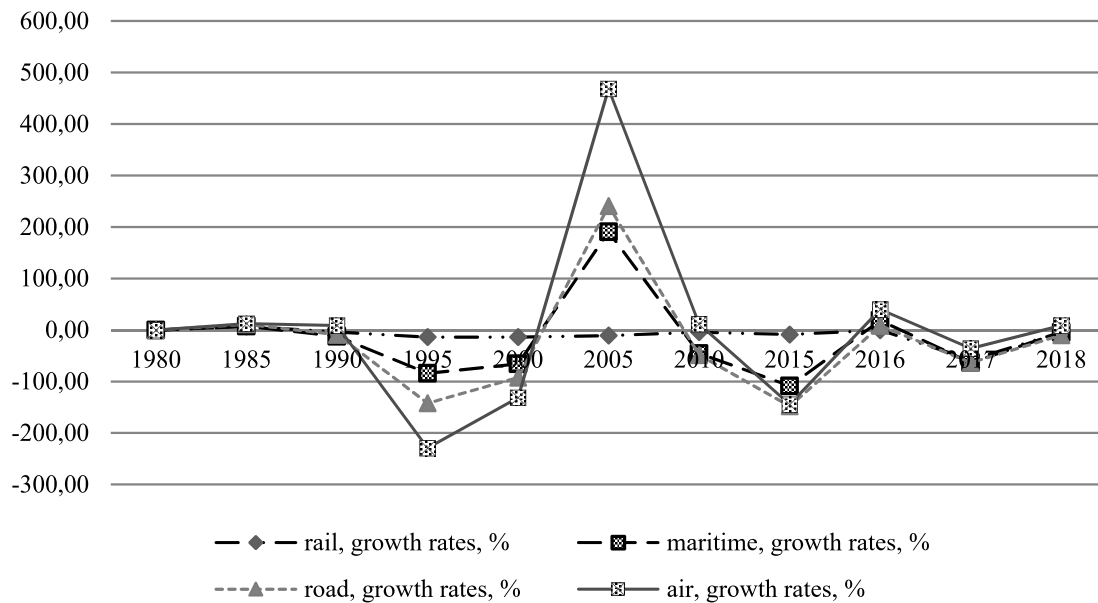


Figure 4. Dynamics of rail, road, maritime, air passenger transportation in Ukraine, growth rates, %, 1980–2018

Source: based on the (Official Website of The State Statistics Service of Ukraine, 2019; of The State Statistics Service of Ukraine, 2019).

Nowadays, the UE provides Ukraine with the assistance for the implementation of structural transformations in transport and road facilities by means of sector budget support program «Support of the Transport Strategy of Ukraine» on the basis of Financing Agreement (Instruction of Ukraine Ministers Cabinet..., 2010). The program aims at institutional reforms implementation in the transport sector in Ukraine, and promoting the development of transport infrastructure in the country, changing the Ukraine law in accordance with international norms and standards.

Key areas of development and infrastructure reforms in Ukraine are determined by Ukraine Transport Strategy till 2020 (The Order of the Cabinet of Ministers of Ukraine..., 2018). These are the following: availability provision and transport services quality increase; the integration of the national transport system into European and international transport systems, improvement of state administration efficiency in the transport sector, transport infrastructure development, rolling stock transport renewal; the investment climate

improvement, transport processes security provision, intensifying of efficiency and environmental performance of vehicles.

4. Conclusion

Reforms proclaimed by the President and the Government of Ukraine continue to be implemented in all spheres of public life. The opening by the state enterprise Ukrzaliznytsya on November 30, 2018, of a connection between Kyiv and the Boryspil International Airport is the confirmation of the successful implementation of the transport reform. Express daily has 27 flights. A high-speed rail express that has a route between Kiev and Boryspil International Airport, has carried 200 thousands passenger at the end of March in 2019. Currently, the train has already made over 6 thousand flights (Kyiv Boryspil Express..., 2018).

The Ministry of Infrastructure aims to create a new river corridor – the "Great Arc" (Official Website of The Ministry Ukraine Infrastructure, 2019), to connect the Dnipro river through the Black Sea and the Danube, as the potential of the Ukrainian rivers is extremely large. Implementation of the project will enable an increase in the volume of Dnipro transportation and make cheaper freight transportation for the supply of goods from Europe. River transport is the cheapest form of transport and, unfortunately, is seasonal for the transportation of people and goods.

The State Road Fund was established in Ukraine since January 1, 2018, and its function is to fund the construction, repair and maintenance of highways of state and local importance. A portal for monitoring the financing of construction and repair of roads has been developed (Monitoring of construction and repair costs..., 2018):

Aviation is the largest increase in the volume of passengers carried in Ukraine. 38 foreign airlines from 37 countries of the world have been performing flights to Ukraine during 2018. According to the statistics on the results of 2018, there was a significant increase in the number of serviced passengers at all major airports: Kyiv (Zhulyany) (51.9%), Lviv (47.9%) and Chernivtsi (53%) were the airports with the highest growth (Official Website of The Ministry Ukraine Infrastructure, 2019).

The carried out analysis of the strategic development program documents of Ukraine and the dynamics of indicators, in particular, in the subdivisions: railway, automobile, marine aviation in the period of 1980–2018 provides an opportunity to determine the main directions of improving of the transport sector efficiency. State policy should be aimed at developing solutions for: providing the population with high-quality, safe and affordable transport services, improving the comfort and speed of trip by the passenger transport, creating multimodal passenger transport networks, introducing electronic payment systems for passenger transport, reducing the cost of domestic and international air

transportation, introduction of developed programs for the development of regional and metropolitan airports, etc.

The development of the Ukraine's sea port industry should use its powerful export potential: the availability of cargo handling capacities; advantageous location of sea ports in order to provide transit freight traffic. The need for the development of river and sea ports, the construction of new high-quality roads of international importance, airports for Ukraine is conditioned both by external and internal needs of the country.

A significant part of transport infrastructure potential in the tourism sector is the deep development of international cooperation in this field. Ukraine is supposed to reform the transport system and harmonize transport legislation with the EU law system to make full use of transit potential and favorable geographical location of the country.

The territory of Ukraine is located at the crossroads of trade routes and has direct water connections with other countries. The advantageous situation for transit transportation should be attractive for the national market and for foreign investors.

Ukraine's policy in the transport sector should be directed to search new efficient energy technologies for development of such new potential industries as ecomotorconstruction and electromotorconstruction, which should promote the development of related ecologically economical sectors in Ukraine.

References

- Association Agreement between the European Union and Ukraine, (2015). Chapter 7, Transport, Retrieved from: <http://www.kmu.gov.ua>, (accessed on 23.03.2019).
- Baryshnikova, V. V., (2015). Regarding the stabilization of the operation of the Ukraine's ports in the conditions of the Autonomous Republic of Crimea annexation, Analytical note, Regional branch of NISS in Odessa. Retrieved from: <http://www.niss.gov.ua/articles/1555/>, (accessed on 24/03.2019).
- Free Trade Area between Ukraine and the EU. Retrieved from: <https://ukraine-eu.mfa.gov.ua/ua/ukraine-eu/trade-and-economic/atm>, (accessed on 22.03.2019).
- Instruction of Ukraine Ministers Cabinet (October 20, 2010), No. 2174, On Ukraine transport strategies approval» during the period till 2010, available at [http://zakon1.rada.gov.ua/laws/show/2174-2010-p.](http://zakon1.rada.gov.ua/laws/show/2174-2010-p/) / Fuel and Power Ministry of Ukraine, available at <http://zakon1.rada.gov.ua/laws/show/2174-2010-p.>, (accessed on 23.03.2019).

- Kyiv Boryspil Express carried 200 thousand passengers. Information from the website of the Ministry of Infrastructure of Ukraine. Retrieved from: https://www.uz.gov.ua/press_center/up_to_date_topic/492882/, (accessed on 23.03.2019).
- Pasichnik, A., and others, (2016). Methodology of Ukraine's transport and customs infrastructure formation: monograph; *University of Customs and Finance*, Dnipropetrovsk: UMSF, p. 168.
- Mikhailichenko, K. M., Yemelyanov, O. Yu., (2019). Analytical note. Concerning prospects of Ukraine's integration into Europe-Asia transport system. Retrieved from: www.niss.gov.ua/content/articles/files/EuAsia-cbffa.pdf, (accessed on 25.03.2019).
- Monitoring of construction and repair costs of roads, Retrieved from: <http://www.roads.brdo.com.ua>, (accessed on 22.03.2019).
- Official Website of The Ministry Ukraine Infrastructure, Retrieved from: <http://mtu.gov.ua>, (accessed on 24.03.2019).
- Official Website of The State Statistics Service of Ukraine, Retrieved from: <http://www.ukrstat.gov.ua>, (accessed on 24.03.2019).
- Pishenin, I., (2017). Strategic management of transport infrastructure of agribusiness enterprises in Ukraine: monograph; *Chernihiv State Technological University*. Kyiv: Talcom, 2017, p. 371.
- Resolution of the Cabinet of Ministers of Ukraine dated June 30, 2015, No. 460 *On Approval of the Regulation on the Ministry of Infrastructure of Ukraine*, Retrieved from: <http://zakon2.rada.gov.ua/laws/show/460-2015-%D0%BF#n8>, (accessed on 22.03.2019).
- Sadlovskaya, I., (2011). Strategic management of the national transport infrastructure of Ukraine: monograph, K.: P.P., V. L. Serdyuk, p. 356.
- Shemaev, V., (2018). Theoretical and methodological principles and priorities of the development of transport infrastructure in the system of economic security of Ukraine: monograph, Kyiv, *National University of Defense of Ukraine*, 2018, p. 366.
- State Statistics Service of Ukraine, (2019). The population (as assessed) by the State Statistics Service on February 1, 2019. Retrieved from: <http://www.ukrstat.gov.ua>, (accessed on 25.03.2019).
- The Order of the Cabinet of Ministers of Ukraine, (2017). *On approval of the medium-term plan of the Government's priority actions by 2020*, April 3, 2017, No. 275-p". p. VII–IX, Retrieved from: <https://www.kmu.gov.ua/ua/diyalnist/programa-diyalnosti-uryadu>, (accessed on 24.03.2019).

The Order of the Cabinet of Ministers of Ukraine, (2018). *National transport strategy of Ukraine for the period by 2030*, May 30, 2018, No. 430-p, Retrieved from: <https://zakon.rada.gov.ua/laws/show/430-2018-p>.

The Ukraine-European Union Association Agreement dated December 23, (2014). Retrieved from: http://www.kmu.gov.ua/kmu/control/uk/publish/article?art_id=246581344, (accessed on 26.03.2019).

Zablodska, I., (2016). Infrastructure provision of transport system development in the region: a monograph. and others; Institute of Economic and Legal Studies of the National Academy of Sciences of Ukraine, Volodymyr Dahl East-Ukrainian National University, Kharkiv National Automobile and Road University – Kyiv; Severodonetsk; The Publishing House of the Volodymyr Dahl East National University, p. 192.