

UDC 332

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## RATIONALIZE OF TRANSPORT DEVELOPMENT SYSTEM IN THE REGION

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**Key words:** region, transport system, types of transport, analysis.

*In the article development of the railway network of Luhansk region as part of the region's transport system is analyzed. Determined that road transport provides an actively functioning and territorial organization of all national economy branches of the region. Determined the aviation and pipeline transportation belongs to the transport system in Lugansk region. Also in the Luhansk region the system of intercity transportation is developing. In the article the comparative characteristics of different types of urban passenger transport is presented. According to the results of reduced research it was found the transport system of the region is a territorial combination of railways, technical service and vehicle traffic combining all modes of transport and all transport links in the process of their interaction and ensuring the successful functioning of the national complex as a whole.*

The transition of the countries economy to the market and the formation of market relations requires a dynamic and balanced development of all parts of the national economy including the transport system. Currently the transport system is one of the highest priorities among the main factors determining the effective functioning of the economy that has become a fundamental prerequisite for its further development.

Today transport system is in a economic crisis due to the country's transport dependence, physical and moral wear of the material-technical base imbalances and irregularity allocation of investment, lack of market mechanism of functioning and management.

Analysis of recent researches and publications indicatives of the wide interest in the problems of regional transport development systems. Related topics reflected in the works of many Russian scientists: O.V. Vasiliev, A.M. Tkachenko, S.I. Doroguntsov, Y.I. Petuyrenko, J.B. Olijnuk, G.I. Nechaev and etc. [1, 2, 4, 6]. Despite of presence a significant amount of literature and publication from this topic, conducting the rationalize of transport development system in the regions constantly relevant and important to justify further prospects.

**The aim of this article** lies in the rationalize analysis of transport development region system on the example of the Luhansk region.

Luhansk region had the well-developed transport system which due to its location in the East of Ukraine playing an important bridging role between other regions of the country. Due to this factor the region has the developed transport rail network that includes 1020 km of rail routes and hubs —

Popasna, Rodakovo, Luhansk and Semeykino. The main railway line passing through the territory of the region: Luhansk — Moscow; Luhansk — Kiev; Kharkiv — Volgograd; Kupyansk — Debaltseve; Debaltseve — Rovenki — Liha, Debaltseve — Luhansk — Millerove. Rail transport is the most used transportation in the Luhansk region. For 2013 were transported by rail 19644.8 thousand tons of cargo. By trucking industry a railway transport is the main transportation, about 50–70 % of the total traffic.

Donetsk railway covers the whole territory of the Luhansk region. Length of railway tracks in the region are 12 thousand kilometers. Operational length of Lugansk region railways ranked 6<sup>th</sup> place in Ukraine. The average density of railways in the region is 44.6 km ( in Ukraine 37.6 km).

In the northern part of the region railway Kupiansk — Svatovo — Milove is crossed, Bilovodsk, Markov, Novopskov districts refer to the areas with underdeveloped rail network.

In the district 5 locomotive depot, 52 railway station are functioning. The total length of railway tracks is — 2009 km. Total length of access businesses roads and organizations amounted 2320 km.

Donetsk railway occupies the extreme south-east of the Donetsk-Pridneprovsk industrial district covering the most industrially developed part of the Donbass (a significant part of the territory of Donetsk and Lugansk regions). The operational length of the road is 2.9 thousand km.

The main frame rail network is a dense network heavily loaded latitudinal and meridian lines with multiple junction of the industrial enterprises sidings, coal mines, thermal power plants, steel mills, chemical and machine-building plants, enterprises of construction industry. On the access track more than 80 % of the total road's loading is done. On the territory served by Donetsk railway there is no place remote from the railway station at a distance of 25 km.

High level of industrial development of the district provided a high freight intensity of its main directions which in 5–6 times is higher than the average network. The most intense site of the Donetsk railway is Donetsk — Yasinovata — Chaplino part of the electrified line connecting Donbass with Pridneprovje, central and western regions of Ukraine. The second traffic concentration of the Donetsk railway goes to East from Debaltseve to Popasna, Lugansk and Dolzhanskij. In the area of gravity of these lines the industrial centers of

the Eastern Donbass — Lugansk, Alchevsk, Lysychansk and Severodonetsk are situated.

To the South from Donetsk the stub line at a major industrial center of Azov — Mariupol departs. Sea port of Mariupol is unique within the Donetsk railway. However due to the relatively small depths of Sea of Azov its importance in transportation is not large. The main types of cargoes through the port from a railroad are coal and ferrous metals.

Sending cargo through the stations of Donetsk railway exceeds their arrival. In the structure of cargo sending just 53 % were coal, half of which is transported within the roads to the power plants and coke enterprises of Donbass. One third ferrous sending metals are also deposited within the road, 2/3 are taking out at the station of other roads.

Donetsk railway is a major sender and receiver of construction materials and limestone for the steel industry. For the volume of imported iron it takes the first place among the country's roads. It receives iron mainly from Krivorizhia. Within the Donetsk railway it is about 30 stations which dimensions of the exceeding loading coal is more than 2 billion tons among them are following: Kalmius, Chumakovy, Rutchenkovo, Mandrykine (Donetsk region), Krasnyi Luch and Krasnodon (Luhansk region).

For sending of ferrous metals are allocated the next station: Sartana (Mariupol), Yasinovata and Alchevsk serving the largest metallurgical enterprises of Donbass. Cargo in large numbers are receiving by the stations which serve the industrial centers of Donbass — Donetsk, Mariupol, Donetsk and Luhansk. By the total functioning of the station (sending with arrival of the cargo) the largest railway junctions of the roads are Mariupol, Donetsk — Makeevka, Alchevsk and Enakievo.

Private rail passenger transportation of Donbass are relatively small.

For the Luhansk region railway is transport communications providing the highest degree of reliability. Most of the railway transport work accounts for cargo rail transport. In general cargo transportation for many years occupied dominant position on the railroad being the only source of income that covers the costs of the unprofitable passenger services.

According to the statistical office data of the Luhansk region by the transport region enterprises were transported in 2013 — 30394.8 thousand tons of cargo which is in 30 % or 9455.1 thousand

tons less in comparison with 2012. The road and rail transport accounted the majority of cargo and passenger traffic. There is a constant increasing of the agencies number that supply services to international transportation. Overall in 2013 the proportion of cargo carriage by rail exceeded the cargo carriage by road transport in 8894.8 thousand tons.

Passengers transport in 2013 slightly decreased about 6 % at the same time the air transportation increased in connection with the addition of international flights to Greece and Turkey. Overall for 2013 passenger transport services have used 236492.0 thousand passengers which is in 6 % less in comparing with 2012. The passenger turnover made in the amount of 3322.6 million pass./km which is in 1.2 % more than in 2012.[3]

Road transport is the most flexible and efficient form of transport for carriage in small batches at a close distance. This type of transport begins and ends the process at sea, river and rail transportation. Motor transport provides functioning and territorial organization of all branches of national economy especially the agricultural industries which occupying an important place in the economy of Ukraine [2, P. 266].

The extensive network of roads in Ukraine and their technical condition are important indicators of a civilized society because significantly influence on: the pace of the companies development; the level of expenditure for cargo and passengers transportation; speed of traffic; the quality and price of transported cargo; mobility, employment and income levels; accessibility of settlements and social facilities; ecological environment. The length of highways in Luhansk region was 5.8 thousand km, concerning the surfaced roads it took in region 16th place in Ukraine in 2013. In Lugansk was situated the largest enterprise of international road transport «TRANS-king» in Ukraine. The main highways of the region: Moscow-Rostov-on-Don; Luhansk-Lysychansk- Kupyansk; Luhansk-Starobilsk-Valuiki; Kupyansk-Starobilsk. Lugansk region's highways are involving in the system of European international routes and include: E40 is the largest road in Europe with a length of 8.5 thousand km, begins at the border with Poland, then check-point «Chegeni» (Lviv region); international highway M04 (check-point «Chegeni» — Lviv); M06 (Lviv — Kyiv); M03 (allotment Kyiv — Kharkiv — Debaltsevo); M 04 (Donetsk — Luhansk — Krasnodon — Izvaryne (Ukraine) — Donetsk (Russia)) then a Russian federal highway M21

which is part of Pan-European transport corridor № 5; European route 40 — passes through the territory of Belgium, Germany, Poland, Ukraine, Russia and other countries; E50 is a length of 5.5 km begins at the border with Slovakia (check-point «Uzhgorod», Zakarpattia) then coincides with the international highway M08 (Stryi — Ternopil — Kirovohrad — «Znamenka»),

M04 («Znamenka» — Dnipropetrovsk — Donetsk — Debaltsevo) and M03 (allotment Debaltsevo — Anthracite — check-point «Dolzhanskij (Ukraine) — Novoshaktinsk» (RF) or Anthracite — Rovenki — Sverdlovsk — check-point «Chervonopartyzansk (Ukraine) — Gukovo» (Russia)), further Russian highway M 04 «Don».

The highway which runs from southern Europe and Black Sea Regions towards the East are using the road sections E87, E58 length of 2.200 km (Reni, Belgrade, Odessa) and further in the direction of Mykolaiv — Kherson — Sevastopol — Novoazovsk (Ukraine) with access to the territory of the Rostov region (Taganrog) or Mariupol, Debaltsevo then using M03, M04 in the direction of the Russian railway M21.

The highways of national and regional significance include the following roads: N-21 (Starobilsk — Luhansk — Krasnyi Luch — Makiivka — Donetsk and further to the Black Sea ports); P-07 (Chuhuiv — Starobilsk — Milove (Ukraine) — Chertkovo (RF)); P-66 (check-point «Demino — Oleksandrivka», Vladivostok — Svatovo — Lysychansk — Luhansk with access to 40, 50, M04, M03).

The sections of main roads passing through the territory of the Luhansk region are organized and their communication facilities largely correspond to European standards which ensures optimum performance of the vehicles. The international orientation of roads coincided with movement of the main cargo including transit of the following areas: West of Ukraine — Kharkiv — Kiev. Thus the road transport infrastructure can take transit cargo and passenger traffic flows based on their distance from the regions of Northern Europe (the direction of Brest — Lviv — Kyiv — Kharkiv — Kupiansk — Starobilsk — Milove (Ukraine); Central Europe (the direction of Wroclaw — Lviv — Kyiv — Kharkiv — Dnipropetrovsk — Donetsk — Debaltsevo — Luhansk — Izvaryne (Ukraine); Southern Europe (the directions of «Black Sea economic cooperation», Reni — Izmail — Odessa — Mykolaiv — Kherson — Melitopol — Berdyansk — Debaltsevo with access to an extensive system of

roads in the border with Donetsk-Luhansk-Rostov agglomeration) [4].

Road transport in the region took a significant place in passenger and cargo traffic. So the volume of passenger traffic is consistently superior rail transport in 10–12 times. By bus transport is carried almost as many passengers as by all other forms of transport (trolleybus, tram, rail, passenger transport, aviation). Road transport dominates the cargo transport for short distances (the average distance of 1 ton cargo transportation is about 20 km) from door to door while providing an almost complete guarantee of the cargo's safety, the urgency and reliable transportation. Many trucking companies have pretty fully equipped production base and an extensive network of infrastructure facilities: bus stations, bus stations, transport-forwarding companies, terminals, etc.

However the roads of Luhansk region do not meet European standards on many indicators, such as speed, axle load, the availability of modern road signs and markings, the necessary number of items of technical and medical assistance, food and rest, refueling and lubricating oil, telephone, etc. There are practically no roads of the first category with multilane traffic at high speeds. Material-technical base of organizations engaged in the development and maintenance of road transport network requires a significant improvement.

Pipeline transport is the most economical and effective for liquid fuel transpiring, fuel and process gas, chemical products. Its development is due to the development oil and gas industry in Ukraine. Over the past decade pipeline transport was growing most rapidly.[2, P. 271] Length of pipelines for general use in 2012 reached 51 thousand km. The volume of shipped cargo is 220,9 million tons including gas — 154,9 million tons of oil and oil products — 62 mill. and ammonia — 4 million tons.

Pipeline transport has sufficient production capacity to ensure Ukraine's energy resources — oil and gas as well as to perform the functions of Russian oil and gas transition to the countries of South-Eastern Europe. However the entire network of pipeline transportation in Ukraine is focused on the supply of oil and gas only from Russia, in accordance with generally accepted strategic approaches to this issue it is impractical. In such way this pipeline transport was formed during USSR times when Ukraine and Russia were part of one state. Through region runs the pipelines: «Union»

from Orenburg, Stavropol — Moscow, pipelines: «Samara-Slavvyansk» from Volga region, «Grozny-Lysychansk» from the North Caucasus, products pipeline: «Lysychansk — Luhansk», «Lysychansk — Donetsk».

Pipeline transport has many advantages: pipelines allow to provide the opportunity of filing virtually unlimited flow of oil, gasoline, diesel and jet fuels in any direction; the pipelines can be implemented in a sustained pumping of various grades of petroleum products, types and different gases, oil types; — work of pipelines is continuous, planned for the year, month, day, and does not depend on climatic, natural, geographical and other conditions which ensures uninterrupted supply of consumers; the pipe can be laid almost in all regions of the Russian Federation, directions, in any engineering, geological, topographic and climatic conditions; pipeline route is the shortest path between the start and end points of the route and may be significantly shorter route than other modes of transport; the construction of pipelines is carried out in a relatively short time provides quick development of oil and gas fields, power pumping plants; — on the main pipelines may be the use of partially or fully automated control systems of technological processes (ACS TP) pumping oil, oil products and gas provided; pipeline transportation has the best technical and economic indicators in comparison with other modes of transport oil cargoes and for transport natural gas in gaseous state it is possible.

The possibility of significant automation and telematics, implementation of automated control systems of technological processes contributes to the maintenance of optimum operation modes of pipeline systems, reduce energy consumption as well as loss of oil, oil products and gas during pumping, drawdown of staff. However despite these advantages one should note two significant disadvantages: high consumption of metal and «stiffness» of the route transportation, i. e., the inability to change the direction of the oil transportation, oil products and gas after the construction of the pipeline.

Air transport is the youngest and the fastest but still expensive. Along with the transportation of cargo, mail and passengers it carries out medical transportation as well as aerial photography, chemical treatment of crops and the forest fire control. The largest airports of Ukraine is Boryspil (Kyiv), Kharkiv, Dnipropetrovsk, Odessa, Vinnitsa, Lviv,

Zaporizhia, Chernivtsi, Kherson, Mykolayiv, Ivano-Frankivsk. The air transport for Ukraine is characterized by large compared with other modes of transport, the seasonal fluctuations: their volume increases from April to August inclusive. The average shipping distance is more than 1 thousand km.

In 2012 the aviation transport of Ukraine carried 0.1 mill. tones of cargo (which is 0.01 % of the total volume of cargo transport) and 8 million passengers. Now in the field of aviation transport in Ukraine there are 97 registered airline with an air operator's certificate, 51 of them has the right to carry passengers. Since 1992 Ukraine is included into the International Civil Aviation Organization, has agreements with 46 countries, 45 foreign companies make 200 flights a week. Ukrainian aircraft have been in constant contact with 45 countries of the world. Air transport of Ukraine in the United «Airlines of Ukraine» owns 27 squadrons, 105 airfields as well as enterprises for the repair of aircraft. Air transport is mainly transports passengers. Since Ukraine gained independence the role of international traffic has been increased. Air lines in the USA, Canada, Israel, Germany, Poland, Austria and other countries are opening. In Luhansk region air transport was presented by Luhansk state enterprise «Luhansk airlines» and Severodonetsk airport.

In Luhansk region the system of intercity transport is developing, road and city electric transport is functioning. Urban passenger transport is an important link in the transport infrastructure that

largely determines the level and dynamics of region's development. It is a complex system that includes several subsystems: the road network, rolling stock, depots, parks and repair base, and the control subsystem.

The backbone is the most capital-intensive subsystem. It allows not only to create the necessary conditions for the functioning of transport but also greatly affects on nature of the residents cities resettlement and district centers. The main load on the backbone network is created by the massive passenger and private vehicle. This load generates the basic requirements for the backbone network of cities. Urban passenger transport is the basis of forming base, its purpose is to provide the life of the city. The system of urban passenger transport includes bus, trolley and tram. Comparative analysis of selected transport types allows you to uncover their advantages and disadvantages (table) [5].

High flexibility and applicability in situations of emergency and mobilization of character are important qualities of a bus. Bus maneuverability compared with the trolley is very limited and the tram cars are completely stripped an ability to maneuver in traffic. The main trolleybuses and trams advantages is a high ecological safety. Electric vehicles have proliferated on routes with stable passenger traffic.

With the transition to a market economy it is observed a fundamental change in the structure of passenger carriers. For several years all urban transport companies have been almost liquidated. They

#### Comparative characteristics of various urban passenger transport types

Characteristic	Bus	Trolleybus	Tram
Isolation from transport stream	Absent		Partly
Possibility of rapid route adjustment	Present	Limited	Substantially limited
Work stability in the time of congestion on the highway route	Remains full	Partly	Absent
Possibility of using mixed mode traffic on the route	Present	Absent	
Ability to quickly maneuver rolling stock	»	»	
Ecology	Low	Middle	High
Outlay for the movement organizing	Minor	Moderate	Middle
Necessity for urban land	The movement is organized for existing streets		Allotment is 6.8—7.4 m
Necessity for daily refueling	Present	Absent	
Safety of transportation	Satisfactory		
The index of outlay transportation (bus is taken as a unit):	1	2.5	6
for 1 km, cost of transportation	1	1.05	1.1

were replaced by the private under-print. So in Lugansk in 1991 there were 107 trams and 120 trolleybuses. Today there are 40 trams and 25 trolleybuses. Now the city's tram network consists of ten routes, length of routes is about 92 kilometers, the length of the trolleybus network is 84 km away and trolleybus routes is just only four. Despite the small quantity of rolling stock, its great deterioration and wastage financing of trolleybuses and trams were not capable of providing awake shift-day perform plan to release the line. This has led to a decrease in shipments of this company. Currently the main mass passenger transport in town is a bus. Transportation by buses of small capacity is quickly developing. The efficient functioning of the road network of the city determines by the routes of the passenger bus transport. A collection of the different transport modes routes that are involved in the service population forms the route network.

Despite the significant contribution of individual entrepreneurs in the transportation of passengers there is no a necessity to restructure carriers, combining them into larger enterprises. Routes and all other elements of the transport infrastructure have their technical and operational performance of the route length, average length of haul between stopping points, the number of the stop points, time, messages, etc. Most of the routes are continuously functioning, providing a continuous process for the transportation of the population. To the short term routes assigned the routes which enable a communication of the city's population with garden areas and suburban areas.

All routes are related to overlapping or partially overlapping routes as evidenced by a copy of routes by the same transport types and also between different types. Analysis of the existing routing scheme passenger transport functioning allows to make a conclusion about the necessity of its improvement.

This situation is caused by: undue lengthening of routes associated with the passage through the center of the city; the formation of high intensity and density of traffic flow on the main streets of the central part of the city which leads to a drastic reduction in the speed and slowing the traffic down in the daytime and peak time periods; the main part of streets and roads (70 %) providing function of passenger transport has low roadway width (8–12 m) that does not meet the requirements of passenger transport intensity and its rolling stock.

Further studies of urban passenger transport systems include definition of passenger traffic on

the network route of the city and such important transport and operational performance of routes as the speed of communication and the content of the rolling stock. It will allow to solve important tasks aimed at improving the functioning efficiency of the route network passenger transport.

Sea transport is relatively cheap, it plays an extremely important role in the formation of Ukraine's foreign economic relations especially with the countries of far abroad. Conditions of Ukraine are favorable for the development of sea-transport: the South of its territory is washed by Black and Azov Seas which almost do not freezing up and connecting with the Mediterranean Sea by the Strait of Biofeedback Fort, the Sea of Marmara and the Dardanelles Strait. The main Ukraine's water artery — is the Dnipro River with tributaries Pripjat and Desna, and also the Dniester, Southern Bug. Sections of the Dniester with its total length of 30 km, mouth of the Danube with a length of 152 km, marine equipment — is 140 km, they are using as the main river routes. All other such navigable rivers as Desna (northern from Chernihiv), Styr, Goryn, Dniester, Samara, Southern Bug, Siverskyi Donets, Ingulets, Vorskla, Psel, Orel — are belonging to small rivers they are used primarily for building materials transport, certain agricultural products but a significant role in placing producing forces they don't play. According to the program of the Euroregion development in the interests of Ukraine it is extremely important to begin the projection of river port on the Siverskyi Donets. It is necessary to make systematic assessment of the quality performance indicators for all 12 permanent checkpoints of the state border located within the Luhansk region with the object to their effective functioning [1].

One of the widely common modes of transport presented in the Lugansk region is Lisichansk's air cargo ropeway connecting Belogorovskiy chalk pit and Lisichansk soda plant «Lissoda». The longest in Ukraine cableway was designed to deliver raw materials (chalk) from Belogorovskiy chalk pit to soda plant in Lisichansk. Road length is 16 563 meters. The speed of the trolleys movement is 9 km/h. The basis of the road make 147 metal supports. The road itself consists of two parts that are joined at the station «Kutova» at a slight angle to each other. Maintenance of the road provides a staff over 100 people in two teams: Lisichansk and Belogorivsk.

The most important function of transport is movement of people and cargoes. There are public

transport and for personal use. There are distinguished between these types of vehicles: rail, road, cartage, pack (on earth), sea, river, lake (water), air (air), pipe-line, electronic.

Transport plays an essential role in the formation and development of region's economic system. Being an integral part of the whole line the transport continues a production process in the sphere of circulation. On the one hand it combines both time and space, separating producers, buyers and sellers, weakens the temporal and spatial gap between production and consumption. On the other hand transport is a sensitive barometer of the region's economy reflecting before its evolution the developments in science and technology. As a consumer of a large equipment's amount, a variety of vehicles, fuels and energy it largely determines the capacity utilization and affects on the structure of the gross regional product. Transport component, i. e. the level of transport outlay in total costs of production, is a significant value. It varies depending on the type of product within 1/5 and sometimes reaches the outlay level of 1/3. All these factors do not have so rapid growth of transport in qualitative changes having the number of its performance. Under the influence of scientific and technical progress in transport development the use of new modern techniques and technologies (containerization, integrated transport system involving the different types of transport, etc.) is increasing, the correlation between its main branches is changing.

Transport divided for functional characteristics into freight and passenger. It is due to the fact that transport is a necessary functioning reason as material production and the scope of maintenance, including passenger transport.

Passenger transport is the sector of non-productive sphere and relates to infrastructure industries. Freight transportation is the sector of industrial infrastructure. Do not directly producing the material goods, freight transport is the fourth branch of material production after mining, processing industry and agriculture. None of these three main branches of material production cannot function without transport providing. The product is ready for consumption only when it is delivered to the consumer.

On the one hand transport is indispensable for functioning production where it delivers raw materials, fuel and energy resources, components, equipment, etc. and delivers the finished pro-

duction to the consumer. Thus in the manufacturing process of the finished product the transport significantly affects on a cost and hence on the efficiency and price. The transport component decreasing in the cost of manufactured products contributes to production efficiency increasing.

Transport is a necessary condition for specialization and integrated development of economic sectors of the regions. It promotes public territory division of labor, the formation of connections between settlements and in them. Without transportation Ukraine's integration into the global economy system is impossible. There are public, departmental and personal purposes transport. Individual transport modes do not function in isolation. Performing a common function to ensure national economic complex with freight and passenger services, various types of transport form a close relationships. As a result a transport system is formed that is developing in collaboration with all national economic complex of the country. Transport system is a territorial union of communication's means, means of transport and transport service that connects all modes of transport and all elements of the transport process in their mutually mod and ensure the successful functioning of the national complex of the country as a whole.

The transport system provides the transport infrastructure including railways, rolling stock, loading and unloading agriculture transport and other companies and organizations that perform loading, unloading and transshipment of cargoes (carried by all transport modes) as well as ways of control and communication, a variety of technical equipment. Train stations, nodes, bus terminals, sea and river ports, docks, airports are the forms of territorial organization of transport. Interaction of different transport types are used in order to transport the nodes of mixed type. The most characteristic are the mixed freight transported by train and vehicle blink. Technological interactions between rail and road transport takes place in a mixed rail-road inter-connectivity when the freight transport has been started by one mode of transportation but continuing by other mode of loading.

Road transport provides functioning of production in those regions where the railway is absent. It transports cargo from one railway stations or begins shipping and delivering to the products station overloading on railway transport, and also delivering cargo by the motor transport from sender storehouses at the train station the export of

cargoes from the stations at the storehouses of the recipient.

The formation of the transport network, its specific structure, the density of railways in general and for individual modes of transport, passing the major highways are determined by the branch structure of the economy, its production specialization, territorial organization, density of population, the peculiarities of historical development, natural conditions and economic and geographic position of the country or its regions.

Transport has a significant impact on the economic development of the region. Transport component in the cost of production was estimated to be about 15–20 %. Thus the main functions of the transport system remain to be unchanged. Transport provides the unity of commodity markets, the relationships of regions, the mobility of citizens. The scope, direction and strategy of transport development must be subordinated to the scenarios of socio-economic development of the region as a whole. We cannot allow transport to be a factor that suppress economic growth.

**Conclusions.** Holding rationalize of the transportation development system in regions are allowed to come to the conclusion that transport has a significant impact on the economic development of any region and the economy of Luhansk region directly depends on the state and development of the transport system because it includes all transport modes and uses for economic development. Therefore the strategy of region's economic development should include the question of transport.

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Received 27.08.2015

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#### РЕТРОАНАЛИЗ РАЗВИТИЯ ТРАНСПОРТНОЙ СИСТЕМЫ РЕГИОНА

В статье проанализировано развитие железнодорожной сети Луганской области как составляющей транспортной системы региона. Установлено, что автомобильный транспорт существенно влияет на функционирование и территориальную организацию всех отраслей национального хозяйства региона. Определено, что к транспортной системе Луганского региона принадлежит трубопроводный и авиационный транспорт. Также в Луганской области развивается система внутригородского транспорта. Приведена сравнительная характеристика различных видов городского пассажирского транспорта. По результатам проведенных исследований установлено, что транспортная система региона представляет собой территориальное сочетание путей сообщения, технических средств транспорта и службы перевозок, объединяющих все виды транспорта и все звенья транспортного процесса в их взаимодействии и обеспечивающих успешное функционирование национального комплекса страны в целом.

**Ключевые слова:** регион, транспортная система, виды транспорта, анализ.

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#### РЕТРОАНАЛІЗ РОЗВИТКУ ТРАНСПОРТНОЇ СИСТЕМИ РЕГІОНУ

У статті проаналізовано розвиток залізничної мережі Луганської області як складової транспортної системи регіону. Встановлено, що автомобільний транспорт суттєво впливає на функціонування і територіальну організацію всіх галузей національного господарства регіону. Визначено, що до транспортної системи Луганського регіону належить трубопровідний і авіаційний транспорт. Також у Луганській області розвивається система внутрішньоміського транспорту. Наведено порівняльну характеристику різних видів міського пасажирського транспорту. За результатами виконаних досліджень встановлено, що транспортна система регіону є територіальним поєднанням шляхів сполучення, технічних засобів транспорту і служби перевезень, які об'єднують усі види транспорту та ланки транспортного процесу у їх взаємодії і забезпечують успішне функціонування національного комплексу країни в цілому.

**Ключові слова:** регіон, транспортна система, види транспорту, аналіз.