

UDC 656.07 : 656.2 : 658

*Elena Petrenko, Doctor of Economics, professor
(The State Administration of Railway Transport
of Ukraine «Ukrzaliznytsa»)*

**FORMATION OF INSTITUTIONAL BACKGROUND LOGISTIZATCIJA
TRANSPORT DURING RESTRUCTURING PASSENGER COMPLEX
RAILWAYS OF UKRAINE**

In this article, from the perspective of institutional analysis investigated the current state of the railway complex problems and development of passenger traffic, the classification of economic flows and types of rail transport passenger correspondence defines the main directions and prospects for reform in the sphere of passenger transport services from the perspective of the desired structural changes.

To achieve the objectives of the study were set and solved the following problems: The features of the development of railway transport as a major infrastructural factors of modern economic growth ; analyzes the current state and prospects of the market for transport services of passenger transport , identified methodological and organizational-economic fundamentals and innovative logistics base in relation to passenger transport railways; justified need logistizatsii management of existing and newly created structures in the field of railway transport; disclosed organizational-economic mechanism of logistics rail transport systems at the micro and macro level, the methodical approaches to the formation of innovative logistics service railways, justified the choice of indicators logistics passenger service in planning passenger, identified key factors of competitiveness of transport companies on the basis of relationship marketing and logistics in the planning of passenger rail services; justified forms and methods of state support logistics rail transport system.

Keywords: railway transport, the institutional preconditions, structural reform, institutional background, passenger transportation, logistics, government regulation.

*Олена Петренко, д.е.н., проф.
(Державна адміністрація залізничного транспорту України
«Укрзалізниця»)*

**ФОРМУВАННЯ ІНСТИТУЦІЙНИХ ПЕРЕДУМОВ ЛОГІСТИЗАЦІЇ
ПЕРЕВЕЗЕНЬ В ХОДІ СТРУКТУРНИХ РЕФОРМ ПАСАЖИРСЬКОГО
КОМПЛЕКСУ ЗАЛІЗНИЦЬ УКРАЇНИ**

Розглянуті питання створення інституційних передумов для формування логістичних підходів у сфері пасажирських перевезень на залізничному транспорті України в ході структурної реформи.

© Петренко О.О., 2015

Збірник наукових праць ДЕТУТ. Серія «Економіка і управління», 2015. Вип. 32

Визначено, що важливою умовою ефективності створюваної логістичної мережі «Укрзалізниці» є комплекс заходів державного регулювання залізничного комплексу. Перспективним напрямком представляється розвиток нових форм державного підприємництва, державно-приватного партнерства, різних механізмів спільного інвестування капіталомістких проектів розвитку залізниць.

Ключові слова: залізничний транспорт, структурна реформа, інституційні передумови, пасажирський комплекс, логістика, державне регулювання.

*Елена Петренко, д.э.н., проф.
(Государственная администрация железнодорожного транспорта «Укрзалізниця»)*

ФОРМИРОВАНИЕ ИНСТИТУЦИОНАЛЬНЫХ ПРЕДПОСЫЛОК ЛОГИСТИЗАЦИИ ПЕРЕВОЗОК В ХОДЕ СТРУКТУРНОЙ РЕФОРМЫ ПАССАЖИРСКОГО КОМПЛЕКСА ЖЕЛЕЗНЫХ ДОРОГ УКРАИНЫ

Рассмотрены вопросы создания институциональных предпосылок для формирования логистических подходов в сфере пассажирских перевозок на железнодорожном транспорте Украины в ходе структурной реформы. Определено, что важным условием эффективности создаваемой логистической сети «Укрзалізниця» является комплекс мер государственного регулирования железнодорожного комплекса. Перспективным направлением представляется развитие новых форм государственного предпринимательства, государственно-частного партнерства, различных механизмов совместного инвестирования капиталоемких проектов развития железных дорог.

Ключевые слова: железнодорожный транспорт, структурная реформа, институциональные предпосылки, пассажирский комплекс, логистика, государственное регулирование.

Creation of transparent and efficient business model passenger rail transportation becomes now a key element reforms of rail transport. Problem of cross-subsidies and lack of investment attractiveness of passenger transport adversely affect the rail system as a whole and ultimately reduce the competitiveness of the whole economy. In terms of reforming the economy strengthened the relationship between transport with the development of other sectors of the economy and social sphere which not only define requirements for transport on the direction, scope and quality of service, but also the possibility of its development, because of the volume of traffic revenues depend on transport companies, which are in modern conditions, the main source of investment. Cheapening, accelerating and improving the quality of passenger traffic lead to increased mobility of the population and improve their living conditions.

Integration of the country into the global transport system, the formation of international transport corridors in Ukraine, the growth of passenger traffic necessitates studying a number of problems associated with logistics technology. Network infrastructure pas-

senger rail complex logistics of regional information centers, branched terminal and the station network to be built by forming a holistic logistics systems for passenger traffic.

Since the middle XX century in almost all developed countries, the organization of transport, information and financial flows becomes a function of a single service, which implements through management and regulation of economic flows. Modern scales of integration of material and information resources are considered key factors of competitiveness of integrated transport and logistics structures. When organizing holistic logistics systems in transport there is a shift in emphasis from the management of individual types of resources to an integrated business process optimization.

The purpose of this paper is to develop organizational and theoretical and methodological foundations of innovative logistics use in the passenger rail traffic.

Development of logistics problems and methods of their use in transport is devoted to a series of works of Russian and foreign authors M.V. Makarenko, Y.M. Tsvetova [1], N.M. Kolesnikova [2], N.I. Bogomolova [3], V.L. Dikan [4], G.D. Eytutis [5], B.M. Lapidus [6], I.S. Besedina, L.A. Mazo, N.P. Tereshina, V.G. Galaburda, M.F. Trihunkova [7], A.U. Albekova [8], B.A. Anikina [9], L.A. Bragina, A.M. Gadzhinskogo, E.A. Golikova, EK Ivakina, S.B. Karnauhova, NA Nagapetiants, Yu.M. Nerusha, A.V. Parfenova, S.M. Reserves [10], A.N. Rodnikova, V.I. Sergeeva, R.V. Ukraintseva, V.V. Scherbakova, R.V. Shehovtsova, D. Bowersox [11], D.J. Closs, D. Lambert, J. Stoke [12], M. Hammer, etc.

Development of passenger routes, the expansion of international transport corridors, building highways highlight the problem of global competition, interaction with integrated European transport systems, international multinationals. In this competition the leading role may belong to the state – corporate form of ownership, which is implemented through a variety of organizational structure and allows you to organize the vertical integration of the chain: «R & D – Manufacturing – Logistics service».

The analysis of the structural reform of rail transport allows us to conclude that the future of logistics technology passenger railways complex must be associated with the implementation of industrial policy priorities to overcome infrastructure constraints of economic growth, increase the investment attractiveness of the travel industry messages active role of the state in creating the right regulatory framework public-private partnerships; with the formation of large, vertically integrated passenger companies with necessary personnel, investment and institutional capacity to organize a reliable, and comfortable transportation process.

Requirements of a logistization on branch of transport industry must take into account the specifics of Ukrainian railways, for which the legitimate use of the term «railway complex» [13]:

- 1) The main product of rail transport - transportation in its final form - is created, usually within a few railways, i.e. at the industry level;
- 2) The railway transport functions throughout the network of trunk railway lines passing through the territory of Ukraine, as a single, organically holistic, continuous in time and space production and processing facility;
- 3) All operational units of rail transport interact on the basis of common technology and integrated information resources;
- 4) For the Ukrainian railways can be characterized by: distance passenger traffic, intensive traffic density using the same infrastructure and limited opportunities «intra specific» competition;

5) The role of the domestic passenger transport is strategically important because of the relatively high proportion of socially significant transport and the provision of transport mobility in different regions.

These features of rail transport made it necessary for the railways as a holistic, complex and unique organizational, technical and economic unit, requiring the development special strategy of a logistization.

Most functioning transportation systems, including rail transport, inherit the main features of complex systems, which include complexity, hierarchy, integrity, structuring, etc. Proceeding from this, the system of rail transport is self-organizing adaptive structure, for which the most important characteristics of the system are reliability, stability and adaptability, to maintain equilibrium in the system under uncertain formation of the passenger services.

Among the most important parameters of quality of rail passenger services are the following:

sequence of execution service «just in time» according with the timetable and schedule of the route – reliability;

performance security service – responsibility;

quality of service , comfort of travel;

transportation tariff value ratio is based on compliance of classiness services (price / quality);

simple procedure to establish contacts with the company, providing customers with convenient timely choice of services – availability;

time spent on transition;

regularity of movement of vehicles;

minimization of risk and lack of confidence from the client - safety;

adequate information support and to minimize transaction costs – costs time to buy/ticketing, finding a proper background information, etc.;

politeness and sociability staff communicating with the customer.

Passenger transport feature is that the relationship flows of material and human resources. Level of traffic is associated with indicators of «quality of life», with the achievement of various stages of post-industrial society.

The main objective of logistics systems for passenger traffic is passenger service from origin to destination with minimum total cost, at a set level of quality transportation - providing each customer transport services transportation in convenient time from the residence to the destination [14].

Specifics of logistics is:

– While the passenger is not only a moving object, but is also the customer of transport services;

– Passenger plays an active role in the transportation of implementing its planning function traveled route selection and travel time, type of transport, method of payment, etc.;

– The considerable number has impact on choice of the passenger, it affects a significant number of factors that are different from the list of optimal delivery of the goods;

– Planning for passenger significant unevenness characteristic of flow processes and demand uncertainty, the availability of seasonal and temporal variations;

– In the passenger transport interests do not always match the passenger and the carrier;

– Occurs when commodities increase its value, and for passenger traffic this is not happening.

The effective application of logistics techniques in communications long distance transportation must: 1) have a concentration of passenger flows in time and space, and 2) be massive to allow the use of rail transport, and 3) have the characteristics of sustainable technological ties, and 4) have certain places of origin and destination, 5) imposes certain requirements on the accuracy of delivery time and service level, 6) carried out on high-speed or express mode (part of inactive stations skipped).

Logistics system «Ukrzaliznytsya» should cover the entire shipment process, which includes a set of control subsystems for the rail network. The main ones are:

- Automated control systems in transportation of goods based on the effective model of the transportation process;
- Passenger transportation management system;
- Single corporate resource management system;
- Information system and business management services;
- E-commerce system that provides the sale of services Ukrainian railways, including intermodal transport;
- Single corporate financial management system;
- Management subsystem - level system safety, including devices railway automation and communication;
- Corporate data network based digital telecommunications system and modernization of communication backbones;
- Unified management information – computing resources;
- A single corporate system of training, management and protection of personnel.

Basic logistics passenger transport is inextricably linked with the daily maintenance activities of consumers by forming flow processes of varying degrees of effectiveness. Innovative logistics in relation to passenger rail transport can be considered as the scope and the science of the consistent introduction of modern achievements of logistics enterprises passenger transport to optimize the passenger. The result is a reduction of total costs and improves the quality of passenger service. Innovative logistics in close cooperation with strategic management provides consistent improvement of the initial starting conditions transportation plan by increasing organizational and economic success factors, improving the composition and quality of services, a radical transformation of the internal logistics environment, changes in organizational structure and intra-and inter-company communications «Ukrzaliznytsi».

All management decisions in passenger transport activities associated with the preparation and distribution of rolling stock, the formation of traffic schedule, schedules, etc., in accordance with the concept of innovative logistics should take into account all the major rationalization of traffic flow processes. Initial process for determining the structure of passenger marketing research (analysis, forecasting, simulation) the structure of demand (passenger) and sentence structure (freight capacity) railways.

The list of objectives of logistics management at the macro level in terms of structural reform include the following tasks:

- Development of institutional and economic conditions for mutually beneficial operation of enterprises of different ownership forms;
- Develop a common concept of construction of the route network;
- Choice of rational direction of transportation;
- Selection of operators and the definition of the scope of work;
- Optimization of the distribution infrastructure throughout the country;
- Choice of transport and vehicles;

– Optimization of the zonal arrangement micro logistical transport systems and coordinate their work on passenger service.

Railway transport logistics system should include two subsystems - both passenger and freight traffic. On the «input» of such a system is a collection of material, information and financial flows, the output – achieved target values for system passenger traffic.

Particularly relevant is the process of demand for logistics system on the market for railway passenger transport, where the management of rail transport has become more complex, requiring coordination and harmonization of procedures.

The purpose of strategic planning of the logistics of the rail system is a strategic forecasting the behavior of the system on the market for passenger services in order to develop optimal management decisions in three areas:

- 1) Implementation of a given service level of passenger services at the lowest cost;
- 2) Innovative development of the corresponding elements of transport infrastructure;
- 3) Adaptive organizational change macro logistical system in the improvement of the efficiency of the transportation process.

Formation of proposals on logistics should be based on a clear knowledge of not only the structure of the passenger, but also the characteristics of gravity areas, opportunities of urban and suburban transport, behaviors, groups of passengers in each direction, the level of their ability to pay, needs, motivation trip. All this allows you to create the most effective project moment schedules to introduce additional services with the necessary level of quality.

To ensure the efficiency of this multi-tier and multi-functional system necessarily requires sufficient controllability of its controlled entities. Important place in the program takes logistization, which can be regarded as the backbone network of rail transport. In relation to passenger services, such centers at the network level could address these strategic objectives:

- Overall coordination of the target logistics flows in passenger transport capacity and carrying capacity of the railway;
- Marketing research of the existing structure and configuration of the passenger in the dynamics and the prognosis for the future;
- The analysis of passenger traffic at major railway stations and lines;
- Prompt and reasonable change schemes formulations and routes of trains according to the passenger;
- Development of a unified general scheme of railway infrastructure sector;
- Coordination of rail transport on the route network, determining the optimal number and dislocation transport companies, to develop recommendations for the appointment of additional trains during periods of seasonal traffic;
- Determining the optimal number and placement of the railway stations on the network, the decision on the termination of inactive work stations;
- Development of methods for determining competitive tariff rates taking into account the tariff components;
- Development of a new price list tariffs based on the introduction of several classes of passenger service based on income differentiation and growth of profitability of passenger traffic;
- Implementation of logistics technologies into a single system service passenger rolling stock and equipment;
- Management conduct research works on traffic and ensure a single , universal information support programs - typical for the entire railway network;

– Drafting regulations that align technological and economic procedures with international logistics management system passenger traffic in the process of international integration of passenger transport.

One of the most important functions of the logistics centers is to participate in the interaction with the operating divisions to develop road traffic schedule, resulting in a need to drastically reduce development time schedule and to establish an effective mechanism for making operational changes to it depending on the actual current demand for transport. However, the process of developing the train schedule and its regulatory framework has never been considered as an integral system that can be optimized and which can be controlled by its deviations.

Drafting optimal train schedules to reduce downtime while waiting for trains departure, increase speed, reduce delays trains, thereby ensuring the necessary level of service for passengers.

Logistic service development train schedule should provide a solution to the necessary tasks: the development of the basic principles, goals and objectives, as well as economic standards in the coming period based on the current market conditions and demand for transport services; accepting applications for the laying of «threads» schedule of passenger trains in the far communication; evaluation of alternative routes, the development of railways services recommendations to eliminate the barrier locations and variant train schedules for the period of «windows»; regulatory train schedule economic monitoring with the technical state of the infrastructure and rolling stock, etc.

Using the theory of a systematic approach to the modeling of strategic planning logistics systems provides a set of interrelated economic and mathematical models that take into account the global development of this system in conjunction with local objectives of its individual units.

After the formation of the model of the optimal level of service of passenger services, which provides maximum economic effect on the functioning of logistics systems, the final stage of planning is determined appropriate for this level of service rational amount of rolling stock by type of passenger cars.

Currently annually on Ukraine's railways transported more than 390 million passengers, almost completely satisfy the growing demand for rail transportation (Tabl.1), but a decrease in passenger traffic since 2008 (Fig. 1). This decline also affects the impact of competition from other modes of transport, especially road and over long distances - aviation and highly profitable customer groups [15].

Tab. 1. Dynamics of passenger rail, road and air transport, as% of 1996

Mode of transport	Year									
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
1	2	3	4	5	6	7	8	9	10	11
Rail	100	93,1	93,1	90,5	92,8	87	86,4	88,7	84,0	82,9
Road	100	76,0	72,7	75,7	77,4	82,4	92,9	99,8	112,6	116,1
Air	100	100	50	50	50	50	100	100	150	200

Mode of transport	Year									
	2006	2007	2008	2009	2010	2011	2012	2013	2014	
1	12	13	14	15	16	17	18	19	20	
Rail	83,3	83,1	82,7	79,2	79,4	79,9	79,7	79,00	72,3	
Road	120,7	126,3	132,2	121,5	112,8	109,3	104,4	101,1	88,2	
Air	200	250	300	250	300	400	400	400	325	

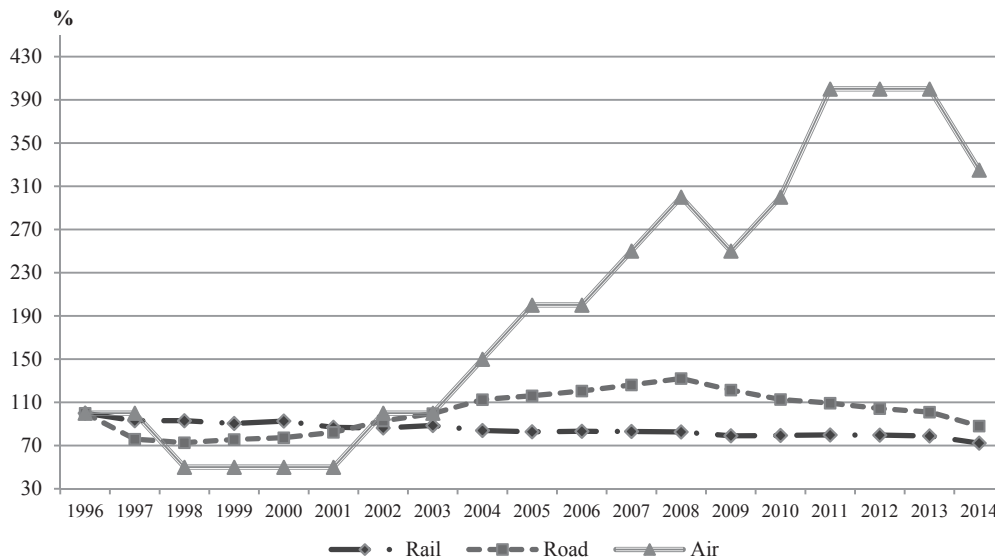


Fig. 1. Dynamics of passenger rail, road and air transport, as% of 1996

Logistics passenger transport is inextricably linked with the daily operations of service consumers by forming processes of varying degrees of effectiveness. Innovative logistics in relation to passenger rail transport can be considered as activity and as the science of sequential introduction of modern achievements of logistics enterprises passenger transport in order to optimize the flow of passengers, material, financial and information. This reduces the total costs, improving the quality of passenger service. In close cooperation with strategic management, the foundation of which are models and methods of dynamic programming, it provides consistent improvement of the initial starting conditions transportation plan by increasing organizational and economic success factors, improving the composition and quality of services, a radical transformation of the internal logistics environment, changes in organizational structure and the system of intra-and inter-company communications «UZ».

Construction of logistic models provides global goal - finding a set of strategies for the development of the market of passenger services, which would ensure the formation of an optimal level of service of passenger services. When organizing holistic logistics systems in transport there is a shift in emphasis from the management of individual types of resources to an integrated business process optimization.

Principles of organization of passenger transport logistics are transformed into account the peculiarities of the railway complex of the country, which is characterized by: a large extent, the unity and information base, the implementation of transport by conveyor principle conjugate roads, the high proportion of social (loss) transport difficulties organization «intraspecific» competition availability of technical and technological and organizational barriers to entry in the industry for small private capital. In these circumstances, there is an objective necessity of centralization and concentration of service vehicles and infrastructure within the «Ukrainian Railways».

The essence of logistics approach is particularly relevant position combining the interests of transport enterprises of different ownership forms, overcoming emerging disintegration phenomena, creating incentives for independent carriers in the transportation segment of the social formation and intercompany coordination participants in the transport process in order to better serve consumers [16].

Logistization travel industry is advantageously carried out using both basic and innovative logistics. The main objectives of innovative logistics rail transport include:

- Generation of new ideas, logistics management strategy traffic flow processes through the use of economic-mathematical, statistical and other optimization models;
- Study, classification and use of world experience of innovation in the field of logistics;
- Development of organizational and methodological adaptation mechanism logistics innovation fund in relation to the characteristics of the national model of passenger traffic.

Implementation of logistics technologies in rail transport can be achieved based on the following organizational innovations considered as structural elements formed logistics transportation management system: creating a network of multi-functional logistics centers and specialized logistics corporations, based on independent companies and subsidiaries based holding company; formation long-term logistical arrangements including participants in the transport process, etc.

The principal feature of the development of modern traffic control organization is to move from information to manage the information-analytical systems, the important role that takes organic interdependence of marketing and logistics research. Logistics services, recycling Received marketing information about the parameters of demand, ensure its coordination with the capabilities and limitations of the logistics supply (capacity and carrying capacity of railways) and carry out practical transformation in transportation demand. Lack of centralized marketing structures does not produce a long-term program aimed at the conclusion of passenger transport to an adequate level of competitiveness.

Thus, an important condition for the effectiveness of the logistics network created «Ukrzaliznytsya» is a set of measures of state regulation of the railway complex, including activities in the field of tariff, tax, licensing, monetary policy. A promising direction is the development of new forms of public enterprise, public-private partnership, the various mechanisms of joint investment capital development projects of railways.

REFERENCES

1. *Transformaciya ekonomiky` ta transport Ukrainy`* / Yu.M. Czvyetov, M.V. Makarenko, M.Yu. Czvyetov, O.V. Levchenko ta in. – DETUT, 2012. – 180 s.
2. *Kolesny`kova N.M. Adapty`vno-garmonizacijny`j mexanizm cinoutvorenniya na zalizny`chnomu transporti: formuvannya, funkcionuvannya ta rozvy`tok: monogr.* / N.M. Kolesny`kova. – K.: KUETT, 2006. – 564 s.
3. *Bogomolova N.I. Finansova strategiya rozvy`tku zalizny`chnogo transportu: sutnist` ta osobly`vosti formuvannya* / N.I. Bogomolova // *Efekty`vna ekonomika*. – 2012. – # 1

4. Dy`kan` V.L. Reformy`rovany`e zheleznodorozhnogo transporta (strategy`ya preobrazovany`j v sy`steme upravleny`ya otrasl`yu) / V.L. Dy`kan`, D.I. Bojko // «By`znes-y`nform». – 2000. – № 11-12. – S. 48-50.
5. Ejtutis G.D. Teorety`ko-prakty`chni osnovy` reformuvannya zalizny`cz` Ukrainy`: monogr. / G.D. Ejtutis. – Nizhy`n: TOV ASPEKT Poligraf, 2009. – 240 s.
6. Lapy`dus B.M. Osnovnie napravleny`ya ekonomy`chesky`x y`ssledovany`j na zheleznodorozhnom transporte v uslovy`yax ego kardy`nal`nogo reformy`rovany`ya / B.M. Lapy`dus, Y`.S. Besedy`n, L.A. Mazo // Vestny`k VNY`Y`ZhT. – 2004. – № 3. – S. 3–13.
7. Ekonomy`ka zheleznodorozhnogo transporta / N.P. Teroshi`na, V.G. Galaburda, M.F. Try`xunkov y` dr.; pod red. N.P. Tereshy`noj, B.M. Lapy`dusa, M.F. Try`xunkova. – M.: UMCz ZhDT, 2006. – 802 s.
8. Al`bekov A.U. Kommercheskaya logy`sty`ka / A.U. Al`bekov, O.A. My`t`ko. – M.: Feny`ks, 2002 – 416 s.
9. Any`ky`n B.A. Kommercheskaya logy`sty`ka / B.A. Any`ky`n, A.P. Tyaruxy`n - Sp.-B: Prospekt, 2013. – 432 s.
10. Rezer S. M. Opty`mal`noe upravleny`e perevozochnim processom v transportnix sy`stemax. M.: VY`NY`TY`, 1978, t. 1. (Ser. Organy`zacy`ya upravleny`ya transportom: Y`togy` nauky` y` texny`ky`).
11. Bauersoks D. Logy`sty`ka. Y`ntegy`rovannaya cep` postavok / : Donald Bauersoks, Dejvy`d Kloss – M.: Oly`mp-By`znes, 2010. – 640 s.
12. Stok Dzh.R. Strategy`cheskoe upravleny`e logy`sty`koj / Dzh. R.Stok, D.M. Lambert – Per. s 4-go angl. y`zd. – M.: Y`NFRA-M, 2005, XXXII, 797 s.
13. Hloskokov V.N. Osobennosti ynnovatsyonnoy lohistyky y ee pryomenenye v sfere zheleznodorozhnoho transporta/V.N. Hloskokov // Kreatyvnaia ekonomika. – 2007. . - №6 – s.6-11.
14. Kopytko V.I. Lohistychnyy pidkhid u stvorenni efektyvnoho mekhanizmu upravlinnya pasazhyrs`kymy perevezennyam zaliznychnym transportom [Tekst]. V.I. Kopytko// Marketynh i lohistyka v systemi menedzhmentu pasazhyrs`kykh perevezen' na zaliznychnomu transporti: Materialy Pershoi Mizhn. nauk.-prakt. konf. – K.: DAZTU, 2009. – S. 54 – 57.
15. Derzhavny`j komitet staty`sty`ky` Ukrainy` [Elektronny`j resurs]. – Rezhym dostupu:<http://www.ukrstat.gov.ua>.
16. Hapanovych V.A. Osnovnye napravlenyya razvytyia yntellektual`noho zheleznodorozhnogo transporta/ V.A. Hapanovych, Y.N. Rozenberh // Zheleznodorozhnyi transport. – 2001. – № 4. – S. 5 – 11.