Методика призначена для виявлення перспективних потенційних кластерів для іноземних інвестицій у рамках програм створення інтернаціональних кластерів, а також для регіональної підтримки організації виявлених в регіоні кластерів у рамках державно-приватних програм, що дозволяє порівнювати різногалузеві кластери.

Висновки з проведеного дослідження. Розроблена методика аналізу умов формування інноваційних кластерних структур та оцінки конкурентоспроможності кластерів на регіональному рівні дозволяє в подальшому розробити підходи до регіональної інноваційно-кластерної політики. Успішний розвиток кластера означає підвищення конкурентоспроможності регіону, збільшення темпів росту валового регіонального продукту, ріст частки регіону в загальному обсязі ВВП країни. Крім того, успішне функціонування кластера забезпечить збереження та створення нових робочих місць, що розширить податкову базу та скорочує виплати з безробіття. Висока результативність кластера підвищує інноваційний та інвестиційний рейтинг регіону.

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UDK 656.615.003 (477)

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THE MAIN PRINCIPLES AND OBJECTIVES OF TRANSPORT AND LOGISTIC SYSTEMS

The article has devoted to problems of efficient transport and logistics systems development. Proposed principles and are presented tasks, which should serve as guidelines and the basic ideas of the formation and development of transport and logistics systems.
Keywords: transport and logistics system, the world economy, problems of globalization, transport complex, the regional system.

Мінакова С.М. ОСНОВНІ ПРИНЦИПИ ТА ЗАДАЧІ ТРАНСПОРТНИХ ЛОГІСТИЧНИХ СИСТЕМ
Стаття присвячена проблемам ефективного розвитку транспортних логістичних систем. Запропоновані принципи і представлені завдання, які повинні служити в якості керівних принципів та основних ідей становлення і розвитку транспортних логістичних систем.
Ключові слова: транспортні логістичні системи, світова економіка, проблеми глобалізації, транспортний комплекс, регіональні системи.

Минакова С.М. ОСНОВНЫЕ ПРИНЦИПЫ И ЗАДАЧИ ТРАНСПОРТНЫХ ЛОГИСТИЧЕСКИХ СИСТЕМ
Статья посвящена проблемам эффективного развития транспортных логистических систем. Предложены принципы и представлены задачи, которые должны служить в качестве руководящих принципов и основных идей становления и развития транспортных логистических систем.
Ключевые слова: транспортные логистические системы, мировая экономика, проблемы глобализации, транспортный комплекс, региональные системы.

Introduction. The global process of goods and passengers movement is too large the scale of the diversity and complexity of the supply chain. And transport in this process plays the leading role. However, the visible and obvious difference between the national regimes of different countries and opportunities for their citizens. The lack of a single means of solving the problems, connected with a transport complex in each state, exclusive approaches taking into account individual features not only at the macro level, but also in the addition to each separate kind of transport as a subsystem of the whole transport complex, in fact play a much more important role in the consequences, which may be as a result formed.

A review of recent research and publications. In recent years, in connection with the deterioration prob-

lems of an objective nature, the lack of financial resources, lack of national cargo base, and a low level of creating intellectual, information support of transport systems, questions of formation and effective functioning of national transport systems are included in the list of state priorities. Analysis of the results of Ukrainian and foreign scientists, experts in the field of transport research [1-8], only confirms the urgency and relevance of the search for adequate approaches. In the article the authors offer the basic principles of formation and main directions of efficient transport systems development with regard to world experience in Ukraine's transport potential and present conditions and trends.

The main material for the research. The processes of globalization, the feeling of «the world on a palm», paradoxically, increase the volume of transport and the demand on the commodity exchange. Only those companies, which are effective and flexible, those who are moving in the direction of changing the world, provided with the relevant technologies and use advanced commercial strategy, will exist in the market and continue to play an important role there.

The size and structure of national and world transport and logistics systems are defined by the volume and the structure of demand for their services, capability and commitment of the national and a foreign investor to finance the development and modernization of the transport system, the direction indicators and growth in related sectors, which are of material and technical base of functioning and development of transport, the possibility of transport enterprises to implement its innovative development.

The volume of demand for transport services and requirements to the level of their quality are determined by the territorial placement of the production base of the state, its structure, specialization and co-operation directions of economic relations, domestic and global, and their intensity, the macroeconomic indicators of activities of the state, business and consumer activity of the population, as well as the density of the population on a certain territory, its age structure, the distance between the settlements and places of production and consumption.

Between the needs of the world economy in the improvement of transport processes and further development of high-tech, highly integrated schemes of transportation of goods with guaranteed preservation of and compliance with strict rhythmic supplies continue to have an impact on the development of transport in the major countries of the world. Long-term tendencies of development of world transport to continue to promote the expansion of the global network of transport communications, increase of their load, and improve the synchronization of the work of different kinds of transport.

Today the transportation of cargo and passengers is not regarded as a mechanical process, separated from man. In all countries of the program of development of transport complex of the show as a priority – the growth of the welfare of the population, directly through implementation of high quality of transport services, and indirectly – through the activation of all spheres of economic life of the state.

The analysis shows that the system of the factors most closely linked with the work of all elements of the transport system. Thus, the results of the study demonstrate strong correlation between the results of the activities of various sectors of the economy, demographic indicators and the transport system.

It is obvious, that decrease in volumes of industrial production and the fluctuations of the level of incomes of the population directly impact on the volumes of transported cargo weight, and the largest number of transported passengers. Record of such addiction in the first place is important when building a predictive indicators.

Table 1 demonstrated by the fact that the reduction of incomes of the population in 2011 led to the geometric a fall in the number of transported passengers.

Table 1
**Main indicators of Ukraine development, %
of the previous year**

	2010	2011	2012	2013
The volume of industrial production	− 5,2	− 21,9	11,2	7,6
The incomes of the population	35,7	6,15	23,1	13,6
The migration level of population, per 1000 people.	14,9	13,4	16,1	17,1
Transportation of passengers	1,4	− 12,7	− 6,0	1,9
Transportation of cargoes	− 1,3	− 21,9	8,5	7,4

Source: Ukraine State Committee of statistics [10]

Decrease in volumes of industrial production – to even greater losses in the part of the carriage of goods. The interconnectedness of these processes can be represented in mathematical form, if we take into account that the mobility of the population (or factor mobility) is one of the major indicators and quality of the population life, and the level of the transport and logistics system development. By the factor mobility is influenced by the level of the population incomes, the level of migration, the direction and pace of industry and agriculture development, systems of tourism, the number of population.

$$K_{моб.} = \frac{\Sigma P}{H}, \text{travel/pers}, \quad (1)$$

where P is the performance of passenger transportation volumes, millions of travels.

H – the number of the population, million people.

or $K_{моб.} = \frac{\Sigma P}{H}$, passenger-km/pers, (2)

where P is the value of passenger turnover, million passenger-km.

H – the number of the population, million people.

With the consideration of the relevant factors, the factor takes the form of the:

$$K'_{моб.} = K_{моб.} (K_{\Delta Q} \times K_{\Delta M} \times K_{\Delta H} \times K_{\Delta Д}), \quad (3)$$

where $K_{\Delta Q}$ – the effect of the production volumes;

$K_{\Delta M}$ – amount of gain (loss) of the population as a result of migration, the migration ratio;

$K_{\Delta H}$ – rate fluctuations population of the study area for the period;

$K_{\Delta Д}$ – rate of the population incomes level change.

To determine the values of the changes factors coefficients:

$$K_{\Delta i} = \Delta i - \frac{\Delta i}{100}. \quad (4)$$

Influence of economic indicators on the degree of the most effective use of the transport cargo capacity can be considered in the following form:

The functioning of the transport system, was denoted through ξ – the production process, the level of intensity of which in the moment of time t takes the form y_ξ^t, where ξ = 1, ..., α. The process of passenger and cargo transportation costs in the amount of $c_{1\xi}$, $c_{2\xi}$,..., $c_{\beta\xi}$ and provides the result of its activity in the

values of $\upsilon_{1\xi}$, $\upsilon_{2\xi}$, ..., $\upsilon_{\beta\xi}$. As a basis of the production process use parameters $c_\xi = (c_{1j}, ..., c_{\beta j})$, $\upsilon_j = (\upsilon_{1j}, ... \upsilon_{\beta j})$, where (c_ξ, υ_ξ) characterize the technological potential of the ξ − process. The whole basis of the processes may be formalized in the form of two matrices with a vector of intensity $y^t = (y_1^t, ..., y_\alpha^t)$ − matrix incoming flow − A, and results matrix − B.

$$A = \begin{pmatrix} c_{11} & c_{12} & \cdots & c_{1\alpha} \\ c_{21} & c_{22} & \cdots & c_{2\alpha} \\ \cdots & \cdots & \cdots & \cdots \\ c_{\beta 1} & c_{\beta 2} & \cdots & c_{\beta \alpha} \end{pmatrix}; B = \begin{pmatrix} \beta_{11} & \beta_{12} & \cdots & \beta_{1\alpha} \\ \beta_{21} & \beta_{22} & \cdots & \beta_{2\alpha} \\ \cdots & \cdots & \cdots & \cdots \\ \beta_{\beta 1} & \beta_{\beta 2} & \cdots & \beta_{\beta \alpha} \end{pmatrix}. \quad (5)$$

In accordance with the vector of intensity at all α-processes build a linear combination of basic processes list with coefficients $y^t = (y_1^t, ..., y_\alpha^t)$.

$$\sum_{\xi=1}^{\alpha}(c_\xi, \upsilon_\xi)y_\xi^t = \sum_{\xi=1}^{\alpha}(c_\xi y_\xi^t, \upsilon_\xi y_\xi^t) =$$
$$= \left| \sum_{\xi=1}^{\alpha} c_\xi y_\xi^t, \sum_{\xi=1}^{\alpha} \upsilon_\xi y_\xi^t \right| = (A_y^t, B_y^t), \quad (6)$$

where the basic processes (A_y^t, B_y^t) participate with intensities $y^t = (y_1^t, ..., y_\alpha^t)$. The model presented in a linear form, but if we consider the entire list of acceptable component of the basic processes, will be formed extended set of:

$$\left| A_y^t, B_y^t \right| \exists\, y^t \geq 0, \quad (7)$$

reflecting the possibility of joint activities and interdependence of the various sectors of the economy.

Consideration of the transport system capacity in the first place as the main condition of a high quality of life of people, and only then, as a means to increase the efficiency of the country economy as a whole − is the basic tendency of the contemporary world community.

For successful implementation it is necessary to perform a number of principles, which can be summarized in the following form. The transport system must be:

− *customeroriented*, the primary reference point for the majority of strategies and programs of transport systems development of different countries. Along with the overall objectives of the safe provision, timely, high-quality, affordable transport services, the main instruments of the implementation of these tasks are of the program of development of transport corridors, axes, motorways of the sea.

This approach creates conditions for the development of all types of transport in accordance with the target preferences in it, on the other hand, provides the filling of existing capacities and potential for the development of new ones.

− *integrated*, provide the opportunity to obtain a smooth, modern, safe, reliable transport services everywhere;

− *international*, able to interact with the international transport and logistics system in respect of the conformity of the world's major technical-technological, environmental, customs standards, the requirements of quality and safety;

− *intermodal*, functioning as a whole transport complex with the possibility to use the facilities of any kind of transport, building a multi-component system, which meets the requests of passengers and cargo owners in advanced, efficient technologies, and reduce transport costs;

− *reliable*, to ensure the safe, timely, accessible, convenient service for all citizens;

− *intellectual*, the basic meaning of this initiative is aimed at creation of common information space, which unites all kinds of transport, the control system, and the users in a single controlled circuit. The task is so global, and how difficult doable. To date, only in the USA, as the main developer of this approach, achieved tangible successes. The creation of a unified architecture intellectual transport network allows you, among other things, to control the three main areas: security (means of transport, monitoring of natural and man-made disasters), environmental protection (control and timeliness of decision-making), mobility (the collection of information in the real-time mode and informing the members of the movement).

− *innovative*, creating an environment that converts the advanced technologies, concepts and ideas into new transport products, processes and systems services quickly and least expensive;

− *ecological* oriented, which in addition to the use of technical and technological innovations in the field of transport and cargo handling, modeling and design in development of regional programs of development. Such an approach facilitates the most efficient use of existing infrastructure and energy resources in parallel with the development of environmental sensitive zones.

Economic growth leads to increased pollution. This fact is confirmed by statistical data. Therefore, when choosing a sustainable path of development, it is necessary to orient on the mechanisms, which will facilitate the transformation of the economy structure in such a way as to its further development will not threaten the environment and does not reduce the quality of life of this country citizens.

Assessment of the impact of transport on the environment it is reasonable to conduct, on the basis of two main categories:

− pollution of the atmosphere and the impact on climate change;

− noise pollution.

This should consistently be viewed by all types of transport, and the available transport network (ports, airports, etc.).

Values of indicators of air pollution and noise emissions are formed depending on the kind of transport, number of miles overcome and, to the maximum extent on the characteristics of the vehicle.

Work on neutralization of the extremely negative influence on the people of polluting agents should be multi-dimensional. Denote only some of them:

− Minimization of the needs of the day-to-day movements, especially in long distances, primarily due to the concentrated development of industrial, commercial and business life of the so-called «sleeping» districts of the city;

− Additional measures to ensure a high quality of public transport services and enhancing the attractiveness of its use of all layers of the population;

− Development of strategic programs for the formation of public opinion in respect of the culture of walking and biking movements at small distances. The development of appropriate infrastructure for walking and cycling (promoting their use as an alternative to private car transport);

− Promoting the use of energy-efficient and environmentally friendly (pure and silent) types of vehicles as for the transportation of passengers, as well as for cargo delivery;

− Collection of payments for pollution of atmospheric air by road, which is based on the economic assessment of damage, should be at the statutory tax rate (representing the total of the damage which may be caused by fuel combustion products in the absence of vital resources, reduced in 2 times), and the penalty rate (based on the excess of actual losses on a normative);

– Maximization of the city potential is mainly due to the increase of the quality of life, attracting tourists, business partners and investors.
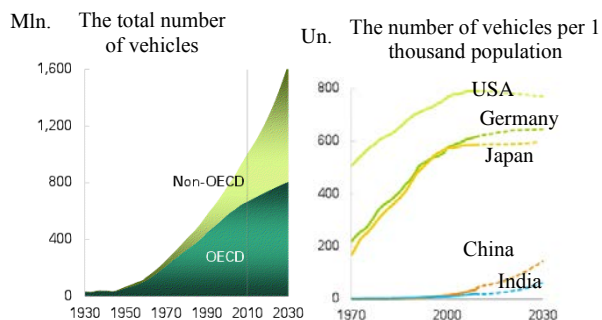
Pic. 1. The growth in the number of vehicles in the countries of the world community

Source: Energy Outlook, 2035 [9]

The execution of these tasks is possible only in the presence of a holistic, global approach. On the other hand, such qualitative transformation can not do without the substantial financial resources, the amount of which is rapidly declining in parallel with the growth of public debt in many, including the developed countries of the world. On the first plan are just those mechanisms, which will give an opportunity with minimum investment to get the desired result. The question consists only in the creation of acceptable conditions or, at least, a departure from the policy of bans.

Conclusions. In the basis of functioning and development of the transport and logistics system should be based on the following trends:

– the improvement of the transport and logistics system, improving its efficiency, and to ensure reliable and uninterrupted transportation, through the quality of awareness of users of all types of transport;

– trends of reducing the demand for certain types of transport as a result of reduction of passengers and cargoes physical movement in the direction of «virtualization» (distribution of telecommunication technology, e-Commerce etc.);

– improving the quality of operational management by the signing of the new interdepartmental agreements – both formal and virtual – often located at the junction of the state and private persons interests, which will give an opportunity to overcome legal and industry-specific restrictions;

– the development of effective and efficient mechanisms for selection of infrastructure projects, especially related to the information infrastructure, which will create additional potential of the passengers and cargo transportation system, with minimum impact on other important economic sectors, such as land use, environmental protection and other;

– the rationalization of the project and operating systems at the macro level, by switching the traffic flows in the intermodal transshipment points (water transport, railways, maritime transport, aviation, etc.);

– increasing the availability of transport services due to the increase in coverage to all large territories and layers of the population, through the development of the distribution network, known throughout the world as the «hub-and-spoke», at the national, regional levels and the level of individual services.

Innovative development everywhere is given a special value, expressed in the form of programs and strategies, supported by tax, subsidiary, legislative and other preferences. Leading directions of this development can be summarised in the following:

– total informatization of transport;

– the creation of cost-effective, resource-efficient and environmentally safe vehicles;

– formation of a multimodal logistics centers;

– creation of terminal cargo delivery systems;

– creation of transport and distribution systems, based on application of logistics technologies;

– the development of container and piggyback technologies.

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