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FUNCTIONING PERFORMANCE FEATURES OF A CITY AS A LOGISTICS SYSTEM

The article reveals the performance features of a city as a logistics system. The need to consider a city from the logistics perspective is grounded. The essence of backbone and supporting subsystems is revealed.

Keywords: city; system; logistic system; flows; subsystems.

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ОСОБЛИВОСТІ ФУНКЦІОНУВАННЯ МІСТА ЯК ЛОГІСТИЧНОЇ СИСТЕМИ

У статті розкрито особливості функціонування міста як логістичної системи. Доведено необхідність розгляду міста з позиції логістики. Розкрито сутність системоутворюючих та системопідтримуючих підсистем.

Ключові слова: місто; система; логістична система; потоки; підсистеми.

Рис. 1. Літ. 10.

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ОСОБЕННОСТИ ФУНКЦИОНИРОВАНИЯ ГОРОДА КАК ЛОГИСТИЧЕСКОЙ СИСТЕМЫ

В статье раскрыты особенности функционирования города как логистической системы. Доказана необходимость рассмотрения города с позиции логистики. Раскрыта сущность системообразующих и системоподдерживающих подсистем.

Ключевые слова: город; система; логистическая система; потоки; подсистемы.

Problem setting. Issues of urban sustainable development have become more actual than ever before and require new methods, technologies and tools. That is why city as a concentration of urban material and non-material flows should be studied from the logistics' positions, and urban sustainable development can be reached by the regulation of these flows.

Recent research and publication analysis. City functioning was explored by F. Stolberg and V. Ladyzhenskiy (2000), O. Karlova (2010), Z. Gerasymchuk and O. Drachenko (2013), A. Melnyk (2007), Z. Gerasymchuk and T. Nischyk (2011) and other domestic and foreign scientists.

Unresolved issues. Despite significant scientific achievements, theoretical foundations of urban sustainable development, based on logistics approach, are untapped. The reason is that the existing approaches to understanding a city as a settlement or a society (Stolberg and Ladyzhenskiy, 2000), city as a system (Karlova, 2010; Gerasymchuk and Drachenko, 2013; Melnyk, 2007), city as a spatial system (Gerasymchuk and Nischyk, 2011) should be complemented with the approach to a city as a logistics system. As evidenced by A. Granberg (2004), region can be considered as a quasi-corporation, i.e. certain integrated entity with a specific activity. However, to be sure that activities are carried out effectively, we need to optimize them. Optimizing processes within certain area (city, agglomeration) with such management approach as logistics, we can consider a region as not only a quasi-corporation, but also a logistics system. The same opinion is shared Z. Gerasymchuk et al.,

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who view a region as a logistics system. Also Z. Gerasymchuk and T. Nischyk (2011) treat a city as a spatial system with interacting subsystems. G. Ivanova-Kostetska (2009) notes that logistics approach underlays the basis for solving problems that arise in cities.

The research objective is to reveal the functioning features of a city as a logistics system.

Key research findings. From our position, a city as a logistics system is featured by a system of input and output flows that occur through consumption of socioecological and economic resources, by availability of internal and external environment where stages of a logistics process (procurement-production-distribution-consumption) actually confirm that city is a logistics facility.

A city as any other logistics system is adaptive, open to interaction with environment, is an organized, structured economic system. It consists of interconnected and interacting participants, united by purpose and economic interests, and is established to optimize resources used in economic flows.

As far as we characterize a city as a logistical system, we should emphasize certain subsystems, according to their functionality and role in logistics processes. For example, A. Melnyk (2003: 267–268), describing a small city, underlines several complicated subsystems: geological-geographic basis, topographic space, biological subsystem, social-demographic structure, physical infrastructure, production complex, administrative management, financial structure, communication structure, institutional establishments, culture subsystem, urban community.

We define the backbone (residential, industrial and serving, medical and educational and cultural) subsystem and supporting (power distribution, transport, distribution and information and communication) subsystems in a city (Figure 1). Thus, urban backbone subsystems consume and reproduce socioecological and economic resources, and supporting subsystems consume and move socioecological and economic resources through the backbone urban subsystems.

1. Residential urban subsystem provides urban public housing, ensures its comprehensive improvement, as well as living comfort in urban areas, including admission to public facilities. Effective organization of residential subsystem is to be achieved by financial affordability for residents in obtaining housing, reducing the cost of its creation and optimal organization of communications, allowing to reduce costs for housing and transportation.

2. Industrial urban supporting subsystem covers companies, offices, financial, banking, insurance and credit institutions and performs production of goods and services to be consumed by urban residents.

3. Medical urban subsystem provides physical reproduction of residents, thus ensuring other urban subsystems with qualitative social resources and covers medical facilities that provide primary, secondary and tertiary healthcare.

4. Educational and cultural subsystem (preschool, school educational institutions, high educational institutions, cultural institutions, sports facilities) aims to create a base for training of qualified social resources in quality and quantities quite enough to be used the backbone and supporting urban subsystems, to raise the level of public awareness, to develop equal and harmonic consciousness, to preserve and enhance cultural heritage, to develop physical culture and sports.

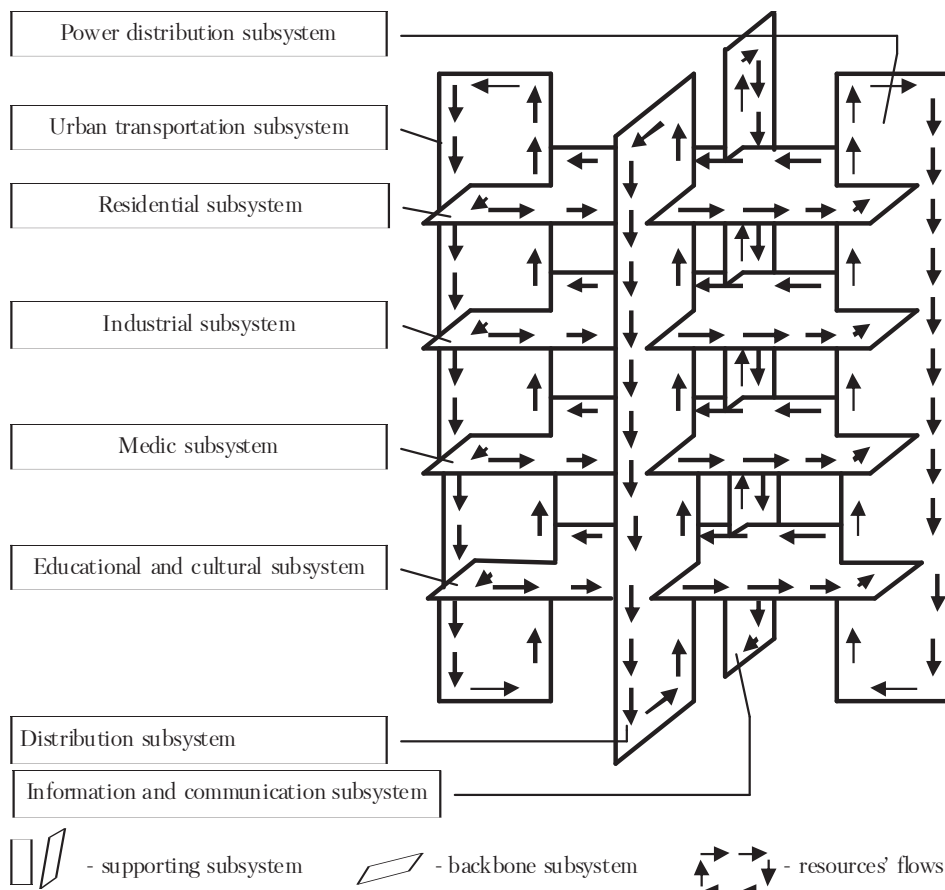


Figure 1. Backbone and supporting subsystems, authors' development

5. Power distribution supporting subsystem (gas, electricity, water supply and drainage systems, communication networks) plays a key role in the logistics system providing distribution of urban energy resources through all the subsystems. Power distribution subsystem influences reduction in consumption of urban environmental and economic resources, due to rational organization of this subsystem, in particular by reducing losses during transportation.

6. Urban transportation subsystem is one of the most important supporting subsystems. It includes transport facilities, urban and suburban routes, streets and road network. Basic functions of this subsystem are: organization of public and intercity transportation, organization of external passenger and freight transportation.

Effective performance of the transportation urban subsystem will ensure the flows' movement in the shortest time and at the lowest cost. It can be performed within the framework of the operative transportation subsystem, where the whole range of services is minimized with respect to loss of time, socioecological and economic resources, and all the necessary related services will be provided for customers. Problems associated with insufficient transport services and uncertain transportation

terms may adversely affect the logistics maintenance of urban sustainable development as a whole.

7. Distribution subsystem is an aggregate of interacting and integrated elements (shops and restaurants, kiosks and markets). Their operation provides optimal and rational organization of goods transfer from suppliers to consumers through the logistics chain at minimal cost, promoting rational consumption of socioecological and economic urban resources. Effect of the distribution subsystem in the logistics maintenance of urban sustainable development is determined by meeting consumer needs for goods and services with minimal investment of time and resources (transport, material) as a result of urban logistics distribution network's construction.

8. Information and communication subsystem provides management of information flows (formed on individual objects) in the logistics' processes in line with improving governance in economic activity, healthcare; improving education and cultural activities, law enforcement, eliminating emergencies. Therefore, information and communication subsystem has significant influence on the logistics maintenance of urban sustainable development.

All the mentioned above subsystems are connected with logistics flows. Thus, logistic flow (a set of homogeneous elements that move in space and time at a certain speed and intensity) does not arise directly in supporting (logistics) subsystems, it occurs in static backbone subsystem as result of consumption of different socioecological and economic resources (spatial basis, capital goods, equipment, machinery, buildings, transport, finance, population, employment potential, human and intellectual capital). In supporting subsystems flows just move between "destinations points" (system-subsystem). Determining backbone and supporting subsystems and their particular operation confirms that a city is a logistics system.

Conclusions. From our position, a city is a complex logistics system with backbone and supporting subsystems focused on fulfilling the needs of a specific group of subjects (urban population) with consumption of socioecological and economic resources. At the same time, the key feature of supporting subsystems is that they can't exist separately from the backbone ones. However, independent existence of backbone subsystems theoretically is possible, but their effective performance will steadily decrease until urban life cycle will terminates. During its operation and interaction with the backbone subsystems, the supporting subsystems undergo changes which means transformation. Therefore, further researches will be devoted to revealing the features in sustainable development of a city maintenance as a logistics system.

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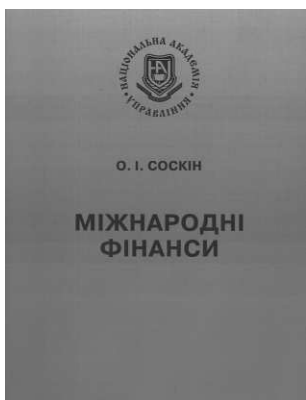
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КНИЖКОВИЙ СВІТ



СУЧАСНА ЕКОНОМІЧНА ТА ЮРИДИЧНА ОСВІТА
ПРЕСТИЖНИЙ ВИЩИЙ НАВЧАЛЬНИЙ ЗАКЛАД
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У посібнику розкриті основні положення, сутність, механізми та функції міжнародних фінансів, розвиток та сучасний стан світової валютної системи та міжнародних фінансових ринків; проаналізовані сучасні тенденції у сфері міжнародних фінансів. Посібник сформовано відповідно до вимог Болонського процесу. Видання містить комплексні тестові завдання, питання для самоконтролю, глосарій. У посібнику знайшли відображення актуальні сучасні дослідження у сфері міжнародних фінансів, матеріали фахових періодичних видань «Актуальні проблеми економіки», «Економічний часопис – XXI» та інших.

Посібник призначено для студентів та аспірантів економічних спеціальностей, а також тих, кому цікаво сформулювати власне розуміння проблематики міжнародних фінансів.