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CITY-ECOLOGICAL PERSPECTIVES OF THE DEVELOPMENT OF HIGH URBANIZED MULTIFUNCTIONAL CENTERS OF THE LARGEST RUSSIAN CITIES

This article presents some results of the author's dissertation research dedicated to formation of an architectural typology of high urbanized multifunctional units of urban structure of the largest cities (further HUMUUS) as centers of social activity, which include buildings, constructions, transportation equipment and open spaces, where human flows transpose, start and end with the purpose of bringing into this space a concentrated maximum of goods, services and information with minimum time expenditures.

This article draws attention to the development analysis of the structure-forming functions of HUMUUS and their town planning and environmental impact on the surrounding area.

The study of planning structures of the largest Russian cities (Samara, Kazan, Nizhny Novgorod) made it possible to identify a number of main objects, in which structure-forming functions of HUMUUS are materialized: railroad complex (historically formed, developed, dominated, system-wide road junction), transport interchange hub (providing intraurban messages), public office and business centers, leisure and entertainment centers, shopping centers.

Basing on researches of Russian and foreign experience, it is possible to predict with full confidence the following trends and streams of environmental and urban development of HUMUUS in the near-term perspective:

Strengthening of the environmental and urban frame by network evolution of HUMUUS;

Inclusion of green areas of HUMUUS in the system of citywide green areas;

Increment of the interest of the investors to the public road junction for the purpose of reorganization of them to full HU-MUUS with all characteristics of high-urbanized and environmental and urban reorganization (separation of traffic and pedestrian flows, maximum capacity, multiple-level system, multifunctional, increase in landscaped green space, reconstruction of engineering systems and communications, the use of modern ecological building designs and finishing materials);

Preferential development of the intracity HUMUUS with all the characteristics of intensification of using space (reduction in area of transporting communication with the help of multilevel junction, increment of a number of stories in a building, the use of the levels of the underground space, mechanization of horizontal communication, release of the territory for planting, use of intelligent eco-stabilizing systems of control and management of functioning HUMUUS);

Development of the territorial growth trends of HUMUUS with reconstruction of the functional processes and environmental settings in joint junction area;

Emphasis of landscape and recreational areas development;

Strengthening the role of creation of living environment and planting in the existing urban planning and functional HUMUUS.

Key words: urbanization, multifunctional junctions, urban structure, the largest cities, structure forming functions, urban environmental prediction.

References

1. Kolesnikov S.A. Arkhitekturnaya tipologiya vysokourbanizirovannykh mnogo-funktsional'nykh uzlov gorodskoy struktury krupneyshego goroda [Architectural Typology of High-Urbanized Multifunction Junctions of the Urban Structure of the Largest City]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2008, no. 3, pp. 4—8. (In Russian)

2. Rentziou A., Gkritza K., Milioti C., Karlaftis M.G. Urban Road Pricing: Modeling Public Acceptance. Journal of the Urban Planning and Development, ASCE. 2010, vol. 137, no. 1, pp. 56–64. DOI: ttp://dx.doi.org/10.1061/(ASCE)UP.1943-5444.0000041.

3. Fischer J.M., Amekudzi A. Quality of Life, Sustainable Civil Infrastructure, and Sustainable Development: Strategically Expanding Choice. Journal of the Urban Planning and Development, ASCE. 2010, vol. 137, no. 1, pp. 39—48. DOI: http://dx.doi. org/10.1061/(ASCE)UP.1943-5444.0000039.

4. Yuan C.W., Chen L., Zhang J.F. Sharing Rates Model of Different Traffic Ways in Urban Comprehensive Passenger Hub. Chang'an daxue xuebao (ziran kexue ban) journal of chang'an university (natural science edition). 2010, vol. 30, no. 3, pp. 66—70.

5. Byrne D. City Region 2020: Integrated Planning for a Sustainable Environment — Joe Ravetz; earthscan. London, 2000, pp. 307+XII, & 19.95 paperback. FUTURES. 2002, vol. 34, no. 2, pp. 215—218.

6. Gel'fond A.L. Arkhitekturno-tipologicheskoe formirovanie delovykh tsentrov Londona na sovremennom etape [Architectural and Typological Formation of Business Centers in London at the Present Stage]. *Privolzhskiy nauchnyy zhurnal* [Privolzhsky Scientific Journal]. 2007, no. 2, pp. 58–66. (In Russian)

7. Zeidler E.H. Multi-Use Architecture in the UrbaN Context. Van Norstrand Reinhold, 1st A edition, 1985, 158 p.

8. Vlasov D.N. Regional'nye transportno-peresadochnye uzly i ikh planirovochnoe reshenie (na primere g. Matsumoto, Yaponiya) [Regional Transport Interchange Hubs in Big and Medium-sized Cities of Japan]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2013, no. 6, pp. 21–28. (In Russian)

9. Belyaev V.L. Planirovanie gradostroitel'nogo osvoeniya podzemnogo prostranstva g. Moskvy [Plans for Development of the Underground Space of Moscow]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2013, no. 1, pp. 35—46. (In Russian)

10. Kas'yanov V.F., Tabakov N.A. Opyt zarubezhnykh stran v oblasti rekonstruktsii gorodskoy zastroyki [Foreign Experience in the Field of Urban Area Reconstruction]. *Vestnik MGSU*[Proceedings of Moscow State University of Civil Engineering]. 2011, no. 8, pp. 21—27. (In Russian)

11. Kas'yanov V.F., Lyapin A.V., Chernysheva O.I. Ekologicheskaya rekonstruktsiya gorodskoy zastroyki [Ecological Reconstruction of Urban Area]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2011, no. 8, pp. 50—57. (In Russian)

12. Karakova T.V. Kontseptsiya kompleksnoy programmy «Sredovoy kadastr goroda» [The Concept of a Complex Program "Environmental Inventory of the City"]. *Vestnik MGSU* [Proceedings of Moscow State University of Civil Engineering]. 2009, no. 3, pp. 42—46. (In Russian)

13. Gel'fond A.L. Istoricheskiy tsentr goroda kak mnogofunktsional'naya struktura [The Historic Center of the City as a Multifunctional Structure]. *Izvestiya vysshikh uchebnykh zavedeniy. Stroitel'stvo* [News of Higher Educational Institutions. Construction]. 2005, no. 9, pp. 81–83. (In Russian)

14. Kerner B.S., Daimler A.G. Optimum Principle for Calculating the Minimum Probability of Congestion. Traffic Engineering and Control. 2011, vol. 52, no. 9, pp. 380—386.

15. Dutsev M.V. Arkhitekturno-khudozhestvennoe formirovanie otkrytykh gorodskikh prostranstv (na primere evropeyskikh gorodov) [Architectural and artistic formation of open urban spaces (for example, European cities)]. *Arkhitekton: izvestiya vuzov* [Architecton: Proceedings of Higher Education]. 2012, no. 40, pp. 28—40. (In Russian)

16. Akhmedova E.A. Sovremennyy general'nyy plan goroda i vozmozhnosti ego realizatsii v usloviyakh rynka [The Modern General City Plan and Its Implementation Opportunities on the Market]. *Promyshlennoe i grazhdanskoe stroitel'stvo* [Industrial and Civil Construction]. 2010, no. 8, pp. 6–10. (In Russian)

17. «Zelenye» standarty v stroitel>stve [«Green» Construction Standards]. *Tsentr ekologicheskoy sertifikatsii — «Zelenye standarty»* [Center for Environmental Certification — «Green Standards»]. Available at: http://www.greenstand.ru/watch/stroy.html. Date of access: 09.12.2014. (In Russian)

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