

An architectural planning of a system of comprehensive institutions in the modern stage

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Abstract: The pace of urban development; the main aims and objectives towards the implementation of large-scale urban projects; their novelty and significance of the stages in the development of the Republic of Kazakhstan.

Key words: *Urban development program; Educational services; Resources educational services; Systems engineering*

1. Introduction

The realization of large-scale programs of urban planning appearing at the new stage of development of the Republic of Kazakhstan acts a great part in further increase of well-being of the Kazakh people. There appear the new problems and tasks for urban planning. Their novelty is conditioned by the shift of emphasis in social development from the mainly industrial to the social and economic purposes.

The new oppositions appearing at the joint of increasing of variety of population needs, the growth of material and technical possibilities, their satisfaction and impracticality to this process of the traditionally- established means of spatial organization of comprehensive service, appeared under different circumstances and established for different conditions (availability, standard radii and the time of movement, fixed structures of building constructions, their capacity etc.) sharpen territorial and planning contradictions, hold a conversion process and loose a capacity to supply the development of service within this system. The given traditional means are gradually consolidating non-equivalence of conditions of consumption of services by population living in the areas of agencies' service with the least set of educational services. Social and psychological awareness of this non-equivalence leads to the large losses as it stimulates an irrational migration of school population within an urban system.

The network of educational institutions is formed as constantly developing system which development assumes changes that are carried out in the course of time. Correctly organized system practically excludes destruction (pulling down) of its separate elements, and assumes the reconstruction which character is easily predicted as completion of construction (Gelfond, 2007).

Little consideration is given to the theoretical level of city problems in the sphere of general educational service of the population not only in architectural-urban-planning area, but also in sociology, economy and other areas. It doesn't allow deepen into specificity of occurring city processes in an education sphere and constrains creation of the theory of functioning of educational system in city structure as of a socially-spatial organism.

Many works of experts and creative teams are devoted to the problems of the organization and calculation of a school network, and also to the architecture of their buildings.

Today the problem of the architectural theory and practice in the field of creation of system of buildings of general educational use should consist not only of solvation of practical questions, but in search of all elements of this system with the purpose to:

- To define the most reasonable functional organization of these elements corresponding to modern requirements of pedagogics;
- To create the most healthy and comfortable conditions of everyday life of rising generation inside network;

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- To construct the correct, rationally organized network, to provide them with good availability and safety of movement of children;

- To define and carry out the most rational methods of reconstruction and reorganization of the existing school buildings composing a network of service;

- To investigate and use all possible ways to increase the efficiency and reduce costs by modernization and reconstruction of existing system of service with educational institutions.

The carried out textual analysis of regulatory Kazakhstan documents has shown that there is still no clearness and unambiguity in the scientific urban-planning literature, that is connected with a problem of placing of certain types of specialized educational institutions in the structure of residential formations in the scale of a city.

Knowledge of dynamics of general educational relations between the objects located in various city areas, in the course of functioning of all network are necessary for definition of those basic directions and signs that create the basis for interaction between various types of school establishments, elements and parts of their structure. These interactions allow all the system of general educational service of the population to keep and constantly increase its integrity in structure of the whole city.

The forecast of prospects of development, even fragmentary, can today facilitate realization of concrete projects in the future. It should assume multi-variant approach of decisions and ways to organize network of educational institutions in structure of a city and allow defining not its concrete forms, and the most probable limits in which there will be qualitative changes of network structure in its perspective development. Such forecast needs concrete definition of the basic recommendations of construction of a new general educational network.

Record keeping of social priorities in the course of designing of new system of general educational service assumes creation of comfortable conditions of its functioning primary, in comparison with old forms (Prasol, 2006).

To characterize the level of general educational service and to satisfy needs of various social groups of the population were used the statistical data of corresponding departments characterizing directions of profiling, designed capacity (quantity of student's places) of school establishment, actual contingent of its pupils, deficiency of places (taking into account shifts), language the education process is carried on, and also studying shifts and other indicators.

For the characteristic of social level of the human habitat of a city it is necessary to use such indicators, as population density in its structural elements and settling in the scale of a city, comfort of residing, population shift as a whole and school population in particular.

Flexibility of the network structure, that allows to consider changes in the development of the industry of education and satisfy the requirements of various

social groups, is reached at the expense of a correct choice of character of placing (dispersal) of specialized educational institutions in planning structure of the city. The arrangement of these objects connected with convenient transport communications around all parts of the city, will expand and add their functions, taking them out on level of interdistrict general educational service.

The system of social and urban-planning parameters should observe and follow below requirements:

- To have the main objective and sub-objective;

- To be capable to allocate the major problems interfering achievement of the purpose;

- To define the primary goals following from necessity of problem solving;

- To define ways to solve these problems.

Overall objective is maintenance of comfortable operating conditions of system of general educational service in the new concept of its development, taking into account social and economic efficiency.

The primary goal is to develop the concept of development of a network of educational institutions in the scale of a city for creation of socially-significant system of service, maintaining maximum social and economic benefit. Thus major factors are considered: natural, historical and national.

Resource base for the development of personality should be well developed network of educational establishments, single system, consisting of mutually complementary buildings of educational establishments, grouped according to urban-planning structural elements of a city.

The existing system of educational institutions of a city with the following characteristics, such as irregularity of saturation rate and disintegration of buildings around network, as well as researches of the material environment of buildings of the educational institutions, constructed under the projects of last years, where there is no basic components of valuable educational establishments, require stage-by-stage urban-planning realization of reconstruction of system of general educational service.

At the first stage social and economic conditions, historical continuity, territorial differentiation on the scale of all existing network of educational institutions should be defined.

At the second stage the structurally-spatial organization of system of general educational service on the scale of urban-planning structural elements of settling which should be provided as more difficult (multilevel), and in the long term perspective become more complicated and develop as many tiered:

- A quarterly maintenance;

- Micro district level;

- District level.

At the third stage there is a search of optimum placing and formation of educational institutions within allocated zones. The multilevel system of the organization of general educational service assumes:

- At the first level – the solution of a problem of formation of qualitative general educational service in borders of inhabited quarter;

- At the second level – in structure of residential neighborhood;

- At the third level – within residential area.

As the nomenclature of the educational institutions which are a part of a network, at the present stage is presented by various kinds of educational establishments with various age and organizational-pedagogical structures, the contents, forms and methods of the organization of teaching process, and also an orientability of profilation so when placing given establishments in difficult spatial structure of a city it is necessary to be guided by multilevel system of the organization:

1. Within residential neighborhood, reconstruction of educational establishments is not reasonable, as more often there is a little packaged building is capable to meet standard requirements, of population living in its radius. Hence, it is most economically reasonable to use an existing building of establishment as a whole or reorganize it in incomplete high school with I and II stages of training. Cooperation and blocking of buildings of teaching and educational use within residential neighborhood shouldn't be kept in mind; however it's necessary to aspire to creation of the unique educational center.

2. In large residential neighborhood and micro districts there is a strong discrepancy between earlier developed systems of service from buildings of the educational establishments appearing during the different historical periods, and new esthetic, social and economic, technical and sanitary-and-hygienic requirements of a location, placing and types of school buildings in their borders. Complexity of reorganization of general educational network is that the most part of school buildings has well remained and terms of their operation have not reached limiting state.

At I stage of reconstruction of the system of educational service in large residential neighborhood and micro districts it is necessary to keep developed traditions and ways of formation of a network of educational institutions and to provide one or two buildings of the basic school in their center which will serve the group of close located high schools. At the given approach the structure streets inside neighborhood remains, and site development becomes more concentrated.

At II stage of reconstruction formation of the unique general educational center as a part of the basic school with the expanded structure educational and specialized premises in the neighborhood center is provided. Coordinated and uniting communications with group of surrounding schools remain the same.

3. In the structure of residential area, when drawing up the project of reconstruction of an existing network of educational establishments on the 1 stage it is necessary to keep placing of school buildings.

At II stage of reconstruction of a general educational network of residential neighborhood it is necessary to keep in mind changes of structure of a network at the expense of partial merge (integration) of buildings of educational institutions and the organization of the specialized educational center (fundamental school). The fundamental school is the educational center which can be projected in new vacant territory of residential area of a city and also is organized at the expense of reorganization of an existing building of the basic school, which is in its center and has sufficient material resources, as well as territory, allowing an extension of additional construction of educational blocks. The given type of school should be the architecturally-expressed center of residential area.

Building in residential neighborhood of fundamental educational institutions often leads to partial enlargement of existing high schools and their transformation into incomplete basic schools with indicators of the specific calculated area approaching to effective standards (building of small objects at each existing school is excluded).

4. Profile School should become of major importance, serving all system on the city basis. The profile school is situated on residential area and city center border and has direct architecturally-planning communications of I degree of service with base schools of residential areas which are in turn connected by spatial communications with each other and the basic secondary schools located in the center of residential neighborhoods and connected architecturally-planning communications of II degree of service with initial and high schools of residential neighborhoods. (A Fig. 1)

Uniting communications are the new elements of the given system of service. They receive various architectural and spatial values and together with the basic volumes compose a continuous number of actively functioning zones of a complex; internal transit streets, esplanades, the small organized park and foot zones etc. may have these functions.

Drawing up of the final project of reconstruction and modernization of an existing network of educational establishments in city structure on each structural urban-planning element, without intermediate decisions – stages is not reasonable.

So, the location and type of educational establishment should be defined by the administrative importance and the sizes of inhabited formation, its features and planning structures. The most rational and economically reasonable is to unite educational institutions in groups on the basis of the most rational interrelations and supplementations, caused by requirements of teaching process.

For qualitative realization of reconstruction and modernization of a school network of concrete residential area by means of additional building of new types of school establishments it is necessary to study a real situation around the city:

- To state the fullest estimation of investigated area in the general structure of a city and the

characteristic of educational buildings that forms its network of service;

- To calculate the quantitative data of children of the school age trained in school establishments of given area and living in area, the total settlement area of all school buildings of area on one student's place and deficiency of the specific settlement area of schools in relation to standard settlement indicators;

- To make necessary calculations for finding-out missing norms of the necessary settlement area for creation of base for the profile training, serving all network of area;

- To find out requirements of the population of area, their preferred directions of specialized profile training (a natural-science direction, technical and social-humanitarian) (Sosnowski and Rusakova, 2006).

Creation of socially-significant town-planning service system of a city by educational institutions on

development of system of secondary education in all inhabited sectors of a city are taken into account.

In connection with realization of the Government program of development of secondary education in Republic Kazakhstan for 2010-2020 declared systematic character of a general educational network can freely be transformed into the following hierarchy of construction: residential area level – basic school; level of city area – the senior school «Bejindik мектеп»; and the "Higher" school becomes a new, central element of a city network.

So, one needs large-scale project creations that will supply an urban integrity of a system of comprehensive service where an idea of concentration, competent rational distribution and an efficient usage of all the comprehensive resources in behalf of each citizen of any residential unit of a city must find its realization. The given problem is narrowed to searching of the new principles of planning building of system of organization of comprehensive service in the main content. The success pre-condition must become a system of projecting The Law of the Republic of Kazakhstan on education, 2007).

References

Gelfond AL The architectural design of public buildings and facilities: Textbook. - M.: "Architecture - C", 2007. - 280 p.

Sadykova S. S., Arynov K. K., Kusebaev U. K., Sadykova Zh. M., Nurdubayeva A. R., Toishiyeva A. A., Zhanyas A. B. Retrospective analysis of construction and islamic religious buildings. International journal of academic research. «Progress» IPS Baku, Azerbaijan, 2015, Vol 7, No 2, Iss 2, Part A, Applied and natural sciences, p. 405-416

Sosnowski VA, NS Rusakova Applied methods of urban research. - M.: Architecture - C, 2006. - 112 p.

The Law of the Republic of Kazakhstan on education. - Kazakhstanskaya Pravda, Information Department, on August 15, 2007. - P. 9-13.

VM Prasol Design of residential and public buildings. - Minsk: New knowledge, 2006 - 240 p.

Zhanyas A. B., Nurkasymova S. N., Sadikova J. M., Kulzhumiyeva A. A., Yermekova Z. K., Baydabekov A. K Information technology on the study of mathematics bachelors nonmathematical specialties. Life Science Journal - Acta Zhengzhou University Overseas Edition. M. Arslan Press POBox 180432 Richmond Hill, NewYork11418,USA. (*Life Sci J*) (Monthly since 2014). [Life Science Journal](#); [Introduction](#); ISSN: 1097-8135; Impact Factor 2012: 0.165.

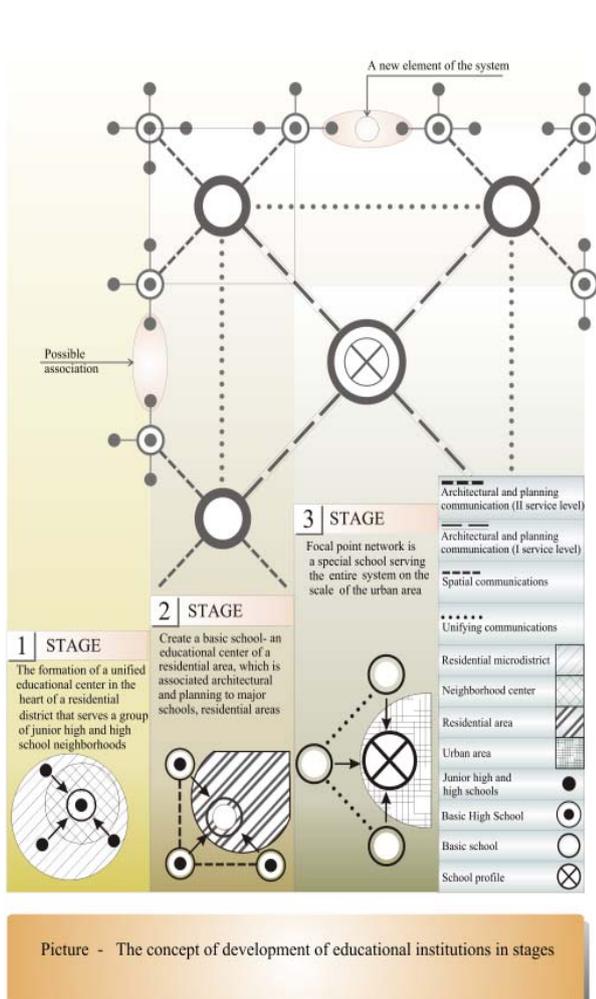


Fig. 2: The concept of development of the system of educational institutions in stages

The new qualitative level is possible only if maximum factors connected with objective conditions of formation; functioning and