History of Planning Structure Development in Irkutsk

A I Kulakov, A U Ree
Department of Drawing, Painting, Sculpture, Irkutsk National Research Technical University, 83, Lermontov St., Irkutsk 664074, Russia
E-mail: ri1977@list.ru

Abstract. The development of Irkutsk was spontaneous; the first streets represented a rather complex system of streets, dead ends, lanes. Throughout the history of the city, several general plans and development projects have been implemented (but not completely). Unlike other large Siberian cities (Novosibirsk, Krasnoyarsk), Irkutsk managed to preserve its historical appearance, architecture and initial planning. During its history the city has passed five stages of the planning structure development. The first stage of the city's history coincides with the formation of the Russian settlements network in Eastern Siberia from the middle of the 17th to the end of the 18th centuries. Like many other Siberian cities, Irkutsk began its evolution from a fortified stockaded town. By the end of the 17th century a trading quarter appeared outside its walls. Currently, the city is developing and growing, so, a relevant issue of the further development direction of the Irkutsk planning structure naturally arises.

1. Introduction
The history of Irkutsk is more than 350 years old. For such a long period, the area of Irkutsk has grown from 1.69 hectares (the area of the Irkutsk Kremlin in 1669-1670) to 27.7 thousand hectares (the current state) [1]. Thus, during this time, the urban environment underwent multiple changes and transformations linked with the socio-cultural, technical, political and other achievements and a person’s vision of the world around. The growth of the city and the number of people living in it leads to a significant "complication of the planning structure, the format of the plan changes (it becomes more dissociated)" [2]. In Irkutsk, one can trace both an extensive (centrifugal tendencies in the development of the city) and intensive (centripetal trends in the development of the city) periods of the city development. Each of them is characterized by certain basic and general rules for the development and formation of urban environment. Thus, the extensive period of the development of the city (centrifugal trends) is an extension of city boundaries, taking into account the creation of new places for settlement growth, i.e. the city territorializes due to the development of adjacent free territories. Along with it, an intensive period of the city development (centripetal tendencies) is the opposite of an extensive one and represents "densification of building, development of vacant and inconvenient for construction territories, using of underground space" [3], and " are accompanied by densification and reconstruction of building, using all spatial resources (increasing the number of storeys, the development of undeveloped territories and underground space)"[4].

According to historico-graphic typology, the emergence and evolution of Irkutsk can be divided into 4 stages.
Stage I: 17th century – the first quarter of the 18th century.
On July 6, 1661 a stockaded town was founded. "The bank of the Angara where the Irkut river flows into it was suitable for farming and cattle-breeding." So, on the right bank of the Angara river Yakov Pokhabov founded a Siberian stockaded town and named it Irkutsk.

The location of this new stockaded town was conditioned by "a well-controlled waterway leading along the Angara to Baikal and then to the south along the Irkut to the cherished yasak (natural duty)" [5,6]. However, till now there is no agreement between scientists regarding the time of Irkutsk foundation: some of them refer this event to the beginning of the 17th century, others - to the middle of the same century. So, according to different opinions, the year of Irkutsk foundation varies between 1656 and 1688 [7]. And only in the middle of the 20th century the fixed date of Irkutsk foundation was officially established [5].

Stage 2: 1725-1892

At the start of the 18th century, Irkutsk was divided into two parts:

1. "Small Town", or actually a stockaded town, began from the bank of the Angara and represented a wooden fortress with adjoining buildings. These included a stone building of the provincial chancery, the house of the vice-governor (former voivodeship) with barns and cellars, the Spassky church. "Small Town" was an administrative center of the vast Irkutsk province (1731).

In the "Big Town", as the stockaded town was called, the trade and economic life of Irkutsk was concentrated. It was inhabited mainly by people from northern regions of Russia: Veliky Ustyug, Yarensk, Pinega, Sol-Vychegda, Pereslavl-Zalessky, who brought their traditions, customs and culture to Siberia. There were also "industrial" people engaged in any kind of industry: fishing, fur-trapping, mica. But the newcomers settled in the trading quarter which, surrounding the fortress, expanded developing from the Angara in three possible directions (Figure 1). The location of the city in the low flood-plain surroundings forced the first settlers to battle with the bogging around the stockaded town.

Figure 1. The plan of Irkutsk in 1767 (fragment). Collection of the Russian State Archive of the Navy, St. Petersburg.
Stage 3: 90s years of the 19th century - 1917

Immediately after the fire, Irkutsk received a real opportunity to conduct a regular planning of its central part, which was previously limited by the already established urban planning scheme. Changes "owing to destruction of many quarters by the fire and curvature of the existing streets" had been made to the developed design city map. They provided street straightening and widening to the sizes put by the Construction Charter (10–15 sazhen) and elimination of undersized quarters, deadlock street sides etc.

With the laying of the RAILWAY, the population of Irkutsk grew twice [6]. During the prerevolutionary period and the first years after the revolution, "the most favorable territories in the boundaries of landscape lines had been developed and on transport lines emerging elements of urban formations outside the compact urban area had appeared "[7]. Also, territories on the opposite banks of the rivers began to develop actively, as their connection with the rest of the city left much to be desired [7].

Stage 4: The Soviet period

With the end of the civil war and the beginning of the Great Patriotic War, active development of "national economy, deployment of large-scale capital construction and reconstruction of all branches of industry took place" [7]. Such an active development of siberian cities "was accompanied by increase of population size of Siberia and profound qualitative changes in its composition" [7]. Due to these changes in the structure of cities, Irkutsk, like some other cities in Siberia, was defined as an administrative, cultural and industrial center of Eastern Siberia.

After the end of the Great Patriotic War, the siberian cities developed on the basis of the potential entranch during the last war: from the european part of the USSR there had been a movement of industrial and scientific institutions, production forces associated with raw materials and fuel and energy resources of the territory. [7]. This process had led to the fact that Irkutsk became one of "the largest hydropower, industrial and cultural centers in the East of the country" [8]. On the other hand, the placement of new enterprises caused subsequently fuzzy zoning of cities and looseness of their development. That problem was caused by resettlement of evacuated population and deployment of new industrial enterprises with subsequent rapid creation of conditions for these facilities operation and adjustment of production [7].

The unembodied general outline for the evolution of Irkutsk of 1940, for a known reason, was adjusted. It was supposed to consolidate the dynamic structure of the city's development and interpret it in a new way of its decentralization, which became a characteristic feature of Irkutsk [8]. In the same version of the town-building document "traditional regularity of the city's growth in the direction of waterways and transport routes is maintained (in the direction of the Nagorny region and the storage pond - the residential areas, in the Kaya valley - the industrial zone) "[8].

At the same time, during the implementation of the amended general plan of Irkutsk, compositional contradictions were formed. They concerned a dividing of the planning structure into separate functional zones. It resulted in "a composite inconsistency between significant undeveloped territories that dismember the city and urban areas with low-rise buildings and low density "[8].

The development of free territories occured in the 1950s and 1960s. It led to an increase in the city's area, its population and the growth of industrial zones, including hydropower complexes, water reservoirs, large scientific centers, and new industries. All this required "huge spaces that caused significant transformations of the surrounding city landscaping environment and, as a result, new forms of settlement and development of the planning structure of cities and suburban areas" [7].

In December 1954, the period of development of cities came. People became more active in exploring the adjacent territories, because "the directions for further development of construction through the introduction of industrial methods, the use of standard design, unification and standardization of constructive elements were determined "[9]. That is about the time when in our country the practice of creating large microdistrict structures with minimal excesses (lack of expressiveness and plastic art on facades) began to spread [7].
The development of such areas occurred on the basis of standard projects of residential, public and industrial buildings and constructions, although for almost 40 years the microdistrict structures underwent changes [10]. At that time, the main problem of urban areas development can be called the lack of "adequate accounting of town planning and landscape features of concrete site areas" [7], as well as the possible emergence or sufficient removal of residential buildings from industrial enterprises.

Stage 5: 90s years of 20th century – 21st century

In the 1990s, in most of Russian cities, including Irkutsk, there were changes in "urban development policy, the main task of which was a rational use of urban areas, that implies a significant consolidation of existing building"[11]. It also included active intervention of builders and developers in the existing urban fabric through creation of new residential and public buildings and structures. All this led to the emergence and aggravation of urban construction and environmental conflicts.

The analysis of functional zones of Irkutsk shows the presence of a disproportion in their structure, a violation of the principle of the optimal relationship between industrial, residential and recreational areas: ideally, the ratio should be 1: 2: 3 [12-20].

2. Conclusion

In the history of the development of Irkutsk public spaces complex approaches took place. They satisfied all modern world trends such as a cooperation between the state, society and investors; a creation of the ensemble in the scale of a square and a street; planning a continuous interconnected network of urban spaces; multifunctionality and polycentricity. The application of these approaches, which are not alien to the city today, will help significantly harmonize the urban space and can become an instrument for the strategy of the city public spaces development.

References

[1] Protasova E V and Hotulev R A 2008 Experience of urban development of coastal territories Problems of using coastal areas in cities. Recommendations to the rules of land use Materials of the international scientific-practical seminar (Irkutsk: Publishing House of IrSTU) pp 100–120
[2] Chernaya M P Siberian city of the late 16th-early 18th century in historical and archaeological reflection (the historiographic aspect) Bulletin of Tomsk State University 3(7) pp 95–112
[3] Ogly B I 1999 Formation of centers of large cities of Siberia. Urban planning and socio-cultural aspects (Novosibirsk: Publishing house of Novosibirsky University) p 168
[4] Erokhin G P 2009 The foundations of urban development: a summary of lectures (Novosibirsk: NGHA) p 102
[5] Pokhabov U 2011 And there is nowhere to stop the jail About the prehistory of the Irkutsk stockade town The Baikal project 29-30 pp 58–61
[6] Ketova E V 2007 Population of Siberia at the end of the 16th - the beginning of the 20th century and the founding of Siberian settlements News of High Schools: Construction 5(581) pp 87–91
[7] Lidin K and Meerovich M 2006 Premonition of polycentricity about the non-Russian project of Irkutsk architects of the 1970s The Baikal project 9 pp 20–3
[8] Ketova E V 2006 About some historical features and mechanisms of evolutionary development of cities of Siberia (16- 18 centuries.) News of High Schools: Construction 6(570) pp 89–94
[9] Zeifert M G 2004 Town-planning aspects of the reconstruction of a residential environment Bulletin of KSACU 1(2) pp 21–4
[10] Dorofeev P 2014 Microdistrict structures of 1960-1980-ies in Irkutsk The Baikal project 39-40 pp 230–51
[11] Pravotorova A A 2007 Principles of urban renewal Proceedings of universities. Building 3 pp 86–90
[12] Polyakova T A The state and evaluation of functional-planning structure of a large city (on the example of Belgorod) (Krasnodar: Belgorod State University) p 23
[13] Ketova E V 2011 Basic principles, mechanisms and regularities of the evolution of the historical cities of Sibiry (late 16th - early 20th century) *News of High Schools. Building* 3 pp 98–104
[14] Didenko V G 2008 High-rise construction: problems and prospects *Sociology of the city* 1 pp 73–78
[15] Ketova E V 2012 *Methods, regularities and principles of evolution of historical cities of Siberia (the end of the 16th - the beginning of 20th centuries)* (Novosibirsk State Architectural and Construction University) p 23
[16] Korzun A V 2011 The planning structure of Irkutsk: factors of sustainable development (retrospective analysis) *Bulletin of IrSTU* 2(49) pp 79–83
[17] Ogly B I 1980. *Construction of cities of Siberia* (Leningrad: Stroyizdat) p 272
[18] Gorodkov A V and Fedosov S I 2009 *Fundamentals of territorial and spatial development of cities: Teaching aid* (Bryansk: Bryansky State Engineering Academy) p 326
[19] Khaikin V G 2007 *Methodology of formation of production potential in reconstruction and renovation of the existing building of a large city* (Moscow: Moscow State University of Civil Engineering) p 39
[20] Shchagin A M 2006 *Fundamentals of territorial and spatial development of cities: Teaching aid* (N. Novgorod: Nizhny Novgorod State Architecture & Construction University) p 48