

Архитектура и строительство

УДК 624:69

DOI: 10.17277/voprosy.2017.03.pp.122-128

PROBLEMS OF RECONSTRUCTION OF URBAN AREAS IN MODERN CONDITIONS

E. V. Alenicheva, O. N. Kozhukhina, I. V. Giyasova

Tambov State Technical University, Tambov, Russia

*Reviewed by Candidate of Architectural Sciences,
Professor G. L. Ledeneva*

Keywords: housing stock; major repairs; renovation; town-planning policy; urban development.

Abstract: The article discusses topical issues of urban development taking into account modern tendencies in town planning policy. The authors substantiate the necessity of increasing the share of reconstruction of buildings, neighborhoods and city districts. The world reconstruction practices have been analyzed. The problems that prevent the effective management of works related to the renovation of buildings have been explored. Economic issues related to renovation of urban areas have been revealed.

The rationale for changing the concept of modern town planning is considered, with regard to the situation in the field of reconstruction and major repairs. The ways of solving the emerging problems of reconstruction of urban areas in modern conditions have been outlined.

Introduction

Currently about 72 % of Russia's population live in cities, towns and urban-type settlements. At the same time, the situation in the sphere of housing and communal services in cities is quite complicated. In Russia, every year up to 4 % of the total area of the housing stock is included in the category of emergency housing. According to some sources, over the past ten years, the

Аленичева Елена Владимировна – кандидат педагогических наук, доцент кафедры «Городское строительство и автомобильные дороги»; Кожухина Ольга Николаевна – кандидат технических наук, доцент кафедры «Городское строительство и автомобильные дороги»; Гиясова Ирина Викторовна – кандидат экономических наук, доцент кафедры «Городское строительство и автомобильные дороги», e-mail: gsiad@mail.tambov.ru, ТамбГТУ, г. Тамбов, Россия.

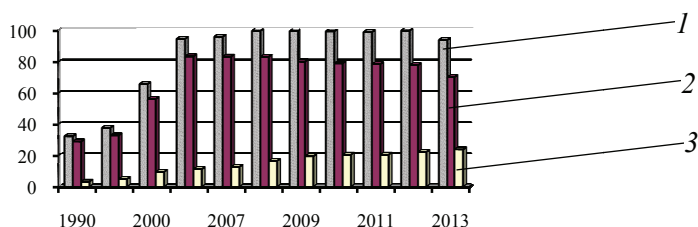


Fig. 1. Dynamics of the volumes of dilapidated and emergency housing stock in the Russian Federation for the period 1990 – 2013:

1 – total amount of dilapidated and emergency housing stock, million m²;
2 – dilapidated; *3* – emergency

area of dilapidated housing stock has almost doubled. Currently, more than 290 million square meters of housing requires major repairs and 205 million requires a fundamental reconstruction. According to [1], the total amount of dilapidated and emergency housing stock in Russia at the end of 2013 was 93.9 million square meters, of which 23.8 million square meters was classified as emergency housing. For greater clarity of dynamics, Fig. 1 shows similar data at the end of 1990: the volume of dilapidated and emergency housing stock was 32.2 million m², of which 3.3 million m² was emergency housing [2].

In this regard, RF Government Resolution No. 1050 provides for the implementation of the Federal Target Program “Housing” for 2015 – 2020, which includes the subprograms “Stimulation of Housing Development Programs of the Subjects of the Russian Federation” and “Modernization of Communal Infrastructure Facilities”. Despite the partial implementation of this program, the problem related to the housing stock remains so urgent that the delay in its solution for another 10 to 15 years will lead to the fact that in a number of cities it will be necessary to decommission about 20 % of the housing stock as unfit for living. The possible way out of this situation is a change in priorities in the urban policy towards a noticeable predominance of reconstruction actions over new construction.

The main problems of urban reconstruction in modern conditions

The tendencies in the reconstruction works in urban areas, especially in recent decades, have been relevant not only to our country. Foreign specialists explored the problems of construction and reconstruction in large cities in the most developed countries in quite a number of works. The majority of these works were survey-analytical. In particular, it was noted that in 1985 the proportion of urban residents in the total population of the most developed countries was 71%, but by 2002 it reached 74 %. In the UK, it rose from 91.5 to 93 %, in Germany it increased from 85.5 to 87.8 %, in Japan it went up from 76.5 to 77 %, in the United States it rose from 73.9 to 74.6 %, in France it increased from 73.4 to 74.5 %, in Italy the increase was from 67 to 70.3 %. The above list of data shows the world trend towards an increase in the proportion of the urban population. The borders of large cities are expanding at an accelerated pace, with former suburbs being built up. Densely built-up suburbs encircle the rings of up to 100 km wide in many cities of North

and South America, Australia and other densely populated regions of the world. Such a process of expanding urban areas is typical for large Russian cities. There is a sharp shortage of free urban land for new construction.

The constant growth in the deficit of construction areas in developed countries has resulted in a significant change in the structure of urban construction. There is a decrease in the share of new construction and an increase in the share of reconstruction of individual buildings, neighborhoods and districts of cities. Therefore, in the USA and Japan, the growth of investments in new construction of uninhabited urban areas is increasing annually by 0.9 %, while investments in reconstruction are increasing by 5 – 10 %. The cost of repairing and rebuilding houses, on average for each of these countries, has increased from 100 to 125 billion dollars over the past five years.

Reconstruction is increasingly taking place on the territory of old building (historical centers of cities). The reconstruction in the areas with existing buildings is associated with many organizational and technological difficulties that are characteristic of foreign and Russian practices.

Thus, there is a need for significant changes in the town-planning policy in Russia, in particular, further development of the cities and their reconstruction. The relative novelty of the problem, the undeveloped concept associated with the predominance of the share of reconstruction over new construction, have given rise to certain problems. One of them is the lack of economic incentives in the implementation of works related to reconstruction.

In connection with the relatively recent development of market relations in Russia, the regulatory framework for construction does not take into account the newly emerging trends. Technical standards seem to be more stable in this regard, however, methodological obsolescence is also observed. Thus, according to *Unified norms and prices for construction, installation and repair work* the remuneration of labor of workers involved in reconstruction and capital repairs is unreasonably understated. This is explained by the need for maximum mechanization of work and replacement of manual work. Meanwhile, the works connected with reconstruction and major repairs presuppose a significant proportion of the processes done manually. This is the effect of the industrialization policy, targeted at transformation of the construction industry into a kind of industrial production. There is another serious factor aggravating the situation in reconstruction. In assessing the performance of the construction organization, one of the indicators is “application of funds”. Meanwhile, it is obvious that it is easier to meet the criteria for this indicator in new construction, since the amount of new materials and structures used is much higher than that in the reconstruction and major repairs. At the same time, the cost of materials and equipment can reach up to 40 % of the estimated cost of work. The lack of economic incentives lowers the interest of contractors in carrying out works related to reconstruction and major repairs.

Another factor, which significantly impedes the development of works related to reconstruction and major repairs, is the practical lack of small-scale mechanization of domestic production. Foreign analogues are expensive and available in insufficient quantities. This problem has long-standing roots. The “gigantomania”, which was characteristic of developed socialism, required the creation of an increasingly heavy and large-scale construction equipment, meanwhile in the conditions of the existing urban infrastructure this kind of

equipment is often useless. Lightweight, mobile, small-sized technical equipment is much more in demand and in acute shortage.

Another problem arises from the previous one. Implementation of reconstruction works in the cramped conditions of the urban environment is extremely difficult due to the lack of appropriate technological developments. The lack of a methodological basis for the development of such organizational and technological documents as Construction Master Plan and Work Execution Design related to works on reconstruction and overhaul significantly complicate the practical implementation of these works, leading in some cases even to violations of safety requirements, which is absolutely unacceptable. It should be noted that attempts to create this kind of developments have been made. For example, in 1998, the Design Institute for the General Plan of Moscow issued the document “Organizational and technological rules of construction (reconstruction) of objects in the cramped conditions of existing urban development” [3]. These Rules contain the organizational and technological requirements for pre-project and project preparation and construction (reconstruction) of buildings and structures in the cramped conditions of the existing urban development. The rules were designed to ensure the safety of existing facilities, reduce construction, economic and material risks, protect the rights and legally protected interests of consumers of construction products and citizens living in the areas of urban development projects. The rules are intended for organizations and individuals (regardless of the right to own, use or lease land), conducting pre-project preparation, design and construction (reconstruction) of different facilities on the territory of Moscow, as well as to inform the citizens, living in the area of urban development projects. The rules should also be considered as a set of extracts from the rules for the production of construction works in Moscow and the current building codes and regulations regarding the organization and technology of construction.

A detailed excerpt from this document gives an idea of the purpose of its creation and designation. However, the specific features of reconstruction as a kind of work fundamentally different from the new construction are not specified. This is noticeable even from the fact that the term “reconstruction” in the text is often repeated in parentheses for the term “construction”. Finally, the specific conditions for the organization of reconstruction works in large cities are of some interest, but they are of a private nature and do not completely solve the problem. When carrying out reconstruction works, it is very difficult to take into account the specific nomenclature of building structures used in reconstruction and capital repairs. With the aim of finding the optimal technical and economic solution to the problem, constant contact is required between representatives of technical departments of contracting organizations and manufacturers of building structures. It is necessary to create a mechanism for such interaction and cooperation, including economic levers.

Probably, it would be possible to single out a much larger circle of problems. For example, the problem of monitoring the state of the surrounding buildings in the area of work related to reconstruction and major repairs was discussed in [4 – 7]. The problems connected with the organization of designer supervision and technical supervision over the performance of

reconstruction works are urgent, since they have not been solved either organizationally, methodologically or economically. The need to improve the regulatory framework has already been noted [8]. However, the situation in the field of reconstruction and major repairs requires more serious changes, rather than recognition of new trends and realities of time. It calls for changes in the concept of urban development.

For example, the concept of typical urban development is being replaced with a tendency to increase the density of historically developed regions by constructing residential buildings of individual design. In these conditions, a number of new town planning tasks have arisen:

- providing comprehensive reconstruction of the areas in the conditions of historically developed buildings;
- increasing density of urban development in compliance with the existing norms of urban planning;
- reconstructing residential buildings to ensure targeted resettlement of families from houses to be reconstructed or demolished into houses that are being built in the same neighborhood in the process of complex reconstruction.

In this regard, a fundamentally new organizational and technological construction problem arises – design and substantiation of rational and effective methods for erecting residential buildings in cramped conditions for complex reconstruction in the historically developed urban areas [9, 10 – 12]. One of the solutions to this problem is the search for the optimal combination of new approaches to the construction of residential buildings in high-density urban areas. Finding an optimal combination will allow for fulfillment of contractual conditions and minimization of construction costs for residential buildings by balancing costs related to the change in organizational and technological situations (construction schedule, installation works, mechanization methods, use of new building materials, etc.) to.

Conclusion

Currently, the trend of constant and continuous development of new urban territories is losing its relevance. The development of cities in the next two-three decades will occur without expanding their borders because of a more rational use of urban areas, completion of development in every neighborhood and district. This approach to urban planning is a principal task that can significantly reduce the costs of developing the engineering and transport facilities and ensure the prestige of renovated residential areas.

Modern cities will be developed mainly through a comprehensive reconstruction of existing buildings and, above all, demolition and replacement of dilapidated buildings, reconstruction of residential buildings of the first mass-construction series, and large-panel buildings of all series; increasing density of industrial areas; reconstruction of engineering and transport facilities; restoration of natural landscapes of the urban environment, etc. In this regard, the problems discussed in this article will remain urgent and require their solution in the near future. We believe that to solve this problem, it is necessary to develop a government-supported program for the development and reconstruction of urban areas.

References

1. http://www.gks.ru/free_doc/doc_2014/rus14.pdf (accessed 28 August 2017)
2. <http://www.ivdon.ru/ru/magazine/archive/n4p2y2015/3453> (accessed 28 August 2017)
3. https://ohranatruda.ru/ot_biblio/normativ/data_normativ/44/44863/ (accessed 28 August 2017)
4. Grebenkin A.M., Grebenkina E.V., Shubin I.L., *Stroitel'stvo i rekonstruktsiya* [Construction and reconstruction], 2015, no. 4(60), pp.87-91. (In Russ.)
5. Dmitriev A.N., Monastyrev P.V., Sborshchikov S.B., *Energoberezhenie v rekonstruiruemykh zdaniyakh* [Energy savings in reconstructed buildings], Moscow: ASV, 2008, 208 p. (In Russ.)
6. http://www.ivdon.ru/uploads/article/pdf/57R_N2y13.pdf_1690.pdf (accessed 28 August 2017)
7. Sheina S.G., Girya L.V., *Inzhenernyi vestnik Dona* [The engineer's messenger of the Don], 2010, vol. 18, no. 4, pp. 509-514. (In Russ.)
8. Alenicheva E.V., Ledenev V.I., Monastyrev P.V., *Arkhitektura i vremya* [Architecture and time], 2010, no. 1, pp. 2-4. (In Russ.)
9. <http://cyberleninka.ru/article/n/problemy-prostranstvennoy-organizatsii-gorodov-s-yarko-vyrazhennym-istoricheskim-tsentrom-na-primere-goroda-rostova-na-donu> (accessed 28 August 2017)
10. Khamavova A.A., *Nauchnye aspekty sovremennykh issledovaniy* [Scientific aspects of modern research], Ufa, 2015, pp.25-27. (In Russ.)
11. Sheina S.G., Belaya E.N., *Stroitel'stvo-2014: Sovremennye problemy promyshlennogo i grazhdanskogo stroitel'stva* [Construction in 2014: Modern problems of industrial and civil construction], 2014, pp.261-262. (In Russ.)
12. Sheina S.G., Belaya E.N., *Nauchnoe obozrenie* [Scientific Review], 2014, no. 9-3, pp. 1007-1010. (In Russ.)

Список литературы

1. Россия 2014: Статистический справочник [Электронный ресурс] / Р76 Росстат. – М., 2014. – 62 с. URL : http://www.gks.ru/free_doc/doc_2014/rus14.pdf (дата обращения: 28.08.2017).
2. Абрамян, С. Г. Реконструкция зданий и сооружений: основные проблемы и направления. Ч. 1 [Электронный ресурс] // Инженерный вестник Дона : электронный научный журнал. – 2015. – № 4. – URL : <http://www.ivdon.ru/ru/magazine/archive/n4p2y2015/3453> (дата обращения: 28.08.2017).
3. Организационно-технологические правила строительства (реконструкции) объектов в стесненных условиях существующей городской застройки: управление развития Генплана г. Москвы [Электронный ресурс] // Охрана труда в России. – URL : https://ohranatruda.ru/ot_biblio/normativ/data_normativ/44/44863/ (дата обращения: 28.08.2017).
4. Гребенкин, А. М. Критерии оценки последствий интеграции шумозащитных сооружений в городскую среду / А. М. Гребенкин, Е. В. Гребенкина, И. Л. Шубин // Строительство и реконструкция. – 2015. – № 4 (60). – С. 87 – 91.
5. Дмитриев, А. Н. Энергосбережение в реконструируемых зданиях / А. Н. Дмитриев, П. В. Монастырев, С. Б. Сборщиков. – М. : АСВ, 2008. – 208 с.
6. Шеина, С. Г. Геоинформационное сопровождение программы по энергосбережению в жилищном фонде муниципального образования на примере г. Ростова-на-Дону [Электронный ресурс] / С. Г. Шеина, Е. В. Мартынова, К. И. Голотина // Инженерный вестник Дона : электронный научный журнал. – 2013. – № 2. – URL : http://www.ivdon.ru/uploads/article/pdf/57R_N2y13.pdf_1690.pdf (дата обращения: 28.08.2017).

7. Шеина, С. Г. Совершенствование методов организационно-технологического проектирования при реконструкции городской застройки с учетом экологических факторов / С. Г. Шеина, Л. В. Гирия // Инженерный вестник Дона. – 2011. – Т. 18, № 4. – С. 509 – 514.

8. Аленичева, Е. В. О современных организационно-технологических проблемах реконструкции в условиях городской застройки / Е. В. Аленичева, В. И. Леденев, П. В. Монастырев // Архитектура и время. – 2010. – № 1. – С. 2 – 4.

9. Вагин, В. С. Проблемы пространственной организации городов с ярко выраженным историческим центром (на примере города Ростова-на-Дону) [Электронный ресурс] / В. С. Вагин, С. Г. Шеина, К. В. Чубарова // Интернет-журнал Науковедение. – 2015. – Т. 7, № 3 (28). – С. 1 – 7. URL: <http://cyberleninka.ru/article/n/problemy-prostranstvennoy-organizatsii-gorodov-s-yarko-vyrazhennym-istoricheskim-tsentrom-na-primere-goroda-rostova-na-donu> (дата обращения: 28.08.2017).

10. Хамавова, А. А. Комфортная городская среда – условие устойчивого развития территории / А. А. Хамавова // Научные аспекты современных исследований : сб. статей междунар. науч.-практ. конф. – Уфа. – 2015. – С. 25 – 27.

11. Шеина, С. Г. Проблемы размещения объектов капитального строительства социального назначения в условиях реконструкции городской застройки / С. Г. Шеина, Е. Н. Белая // Строительство-2014. Современные проблемы промышленного и гражданского строительства : материалы Междунар. науч.-практ. конф. – 2014. – С. 261 – 262.

12. Шеина, С. Г. Социально-экономические аспекты формирования и развития сети дошкольных образовательных учреждений в условиях реконструкции городской застройки / С. Г. Шеина, Е. Н. Белая // Научное обозрение. – 2014. – № 9 (3). – С. 1007 – 1010.

Проблемы реконструкции городской застройки в современных условиях

Е. В. Аленичева, О. Н. Кожухина, И. В. Гиясова

ФГБОУ ВО «Тамбовский государственный технический университет», г. Тамбов, Россия

Ключевые слова: градостроительная политика; жилищный фонд; застройка; капитальный ремонт; реконструкция.

Аннотация: Рассмотрены актуальные вопросы реконструкции городской застройки с учетом современных тенденций в градостроительной политике, обоснована необходимость преобладания доли реконструкции отдельных зданий, кварталов и районов городов над новым строительством. Выполнен анализ состояния реконструктивных работ в мировой практике. Проанализированы проблемы, препятствующие эффективному ведению работ, связанных с реконструкцией застройки. Выявлены сложности экономического характера, возникающие при проведении реконструкции городской застройки. Обоснована необходимость изменения концепции в области современного градостроительства с учетом ситуации в области реконструкции и капитального ремонта. Намечены пути решения возникающих проблем реконструкции городской застройки в современных условиях.

© Е. В. Аленичева, О. Н. Кожухина, И. В. Гиясова, 2017