Advances in Economics, Business and Management Research, volume 85
2nd International Conference on Economy, Management and Entrepreneurship (ICOEME 2019)

Integrated Formation of a Million-city's Infrastructure

Anna Yu. Kosobutskaya
Department of Economics and Management of Organizations
Voronezh State University
Voronezh, Russia
E-mail: anna.rodnina@mail.ru

Mikhail N. Bakhtin
Postgraduate Student of the Department of Economics and Management of Organizations
Voronezh State University
Voronezh, Russia
E-mail: bakhtinmn@yandex.ru

***Abstract*—The article analyzes the strategy of socio-economic development of the Voronezh city, which is a typical Russian city with a million-plus population. The analysis made it possible to determine that the system of the city strategic planning has transformed from a fragmentary vision of the infrastructure as a set of transportation facilities to its presentation in the form of elements ensuring the spatial and functional unity of the city. The task of planning the infrastructure support of the social and economic development of a million-city in the spatial development sphere has been solved to the utmost. Infrastructure planning applied to the social sphere is less justified and focused mainly on the traditional forms of its functioning.**

Keywords—infrastructure; spatial development of a city; city with a million-plus population (million-city); industrial; public utility and social spheres of the city

I. INTRODUCTION

The formation of an effective infrastructure for the regions of Russia as a large, territorially divided country with uneven development of the economy [1] is currently one of the main socio-economic problems. The solution to this problem is possible only based on effective and reliable forecasting of socio-economic processes occurring in the regions and their territorial and functional subsystems [2]. The other side of the problem is intensive changes in regional development in both spatial and temporal aspects [3]. According to the laws of the market economy, the changes are largely spontaneous. In general, this ensures the adaptation of various economic subsystems to the requirements of the environment. However, spontaneous processes carry significant threats to the prospects of specific territorial and functional subsystems of the country. One can deceive oneself that a death or depression of an economic potential of enterprises, regions and cities provides technical and social progress in the future. Nevertheless, it should be noted that a society's destruction that occurs during such a "progressive" motion casts doubt on the potential of not only relatively weak regions and other administrative-territorial units but also the country as a whole. In this regard, Russian regions are currently working on their socio-economic strategies for the period up to 2035. Each of the strategies is designed to solve the problems of administrative-territorial units as a whole and their subsystems [4].

II. PROBLEMS OF A MILLION-CITY'S INFRASTRUCTURE FORMATION (AS EXEMPLIFIED BY VORONEZH DISTRICT)

The features of the socio-economic development of the Russian regions are the following: the greatest concentration of human, material, financial resources and, accordingly, the main economic potential is concentrated in large cities, especially in million-cities. The central idea in the cities' strategies is turning them into "smart" cities [5], [6].

The authors of the article are of the same view. However, they consider an integrated infrastructure development, which allows the formation an integrated system, as an effective way to solve the socio-economic problems of million-cities. The development of "smart" infrastructure is only one of its aspects.

Let us consider the state of Voronezh's infrastructure support as a typical provincial city, not a part of the "club of capitals", which, in our opinion, includes the three most economically developed million-cities: Moscow, St. Petersburg, and Kazan.

The data on the development from the "Strategy of socio-economic development of the urban district the city of Voronezh for the period until 2035" (hereinafter the "Strategy") are employed as a basis of our analysis [7]. Analysis of the data presented in the "Strategy" allows us to conclude that the development of the city infrastructure goes with significant deviations from the planned results. Thus, while planned projections of the city's socio-economic development demonstrate a sufficiently high general level of execution, indicators primarily of the roadway network development have not been reached. The key performance indicator "Share of roads meet transport operating requirements for local public road network" has been achieved only by 20.6%; "stretch of constructed (reconstructed) public local hard-surface roads (cumulative)" — by 62%; "number of constructed (reconstructed) transport interchanges" — by 0%. A high level of execution is presented upon the indicators "housing facilities equipped with water supply" (99.5%); "housing facilities equipped with wastewater disposal" (99.8%) [7]. At the same time, such indicator as "balanced financial result of organizations located in the urban district territory" is carried out to 191.3% [7].

For information on – other infrastructure subsystems in the plan for the period previous the development of the "Strategy" were not distinguished.

Thus, it is possible to observe imbalance both in the system of previous planning, and in the execution of planned figures.

According to the results of the strategic analysis, it is noted in the "Strategy" that there is an underdevelopment and low quality of transport communications, and the city's road network does not meet its needs and is used at the end of total traffic capacity [7].

III. Integrated Approach to Setting Goals and Tasks of the City Infrastructure Strategic Planning

The development of the "Strategy" allowed of the switch on the integrated planning of the million-city infrastructure, ensuring the development of all its socio-economic subsystems.

The basis for such planning is the development and improvement of basic infrastructure facilities such as the high-speed Moscow-Adler highway, airport "Chertovitskoe" located on the Voronezh agglomeration territory, a belt highway, a belt line railway as development opportunities. At the same time, it should be pointed out that only transport infrastructure facilities are mentioned in the list of possibilities. This is substantial, but not the only subsystem of the city infrastructure. The list of the opportunities does not include such important components of the infrastructure as informational-communicational and social. Nowadays, their values are no less important than efficient transport communications.

The deterioration of the infrastructure components of the city's socio-economic system as a part of threats is not mentioned. This creates certain problems in formation of a systemic view on the development of infrastructure.

Fragmentariness in the city infrastructure description in the composition of opportunities and threats have affected the strategic goals formation. The structure of "Strategy" suggests a three-level system of strategic goals. They are the general goal (goal of the first level), three strategic goals (second-level goals), and functional goals (goals of the third level). The general goal is to achieve a high level and quality of life of the Voronezh population, improving the business and investment climate. The strategic goals of the second level comprised of achievement of leadership positions of the Voronezh district in terms of human capital and quality of life development, reduction in socio-economic inequality; the support of sustainable economic development based on innovation sector growth and business environment improvement; effective spatial development, formation of an aesthetically attractive, friendly, comfortable urban environment.

Within the development of the functional goals, the infrastructure is mentioned only in the third goal of the second level. The functional goals in this strategic block comprised of transport communications accessibility, continuity and safety provision in the main areas of passenger and cargo traffic; infrastructure development of housing and communal services. There is certain logic to this, since this infrastructure refers to an effective spatial development. However, there is a noticeable limitation associated with the traditional understanding of the infrastructure as a set of facilities that provide spatial communication. Selection of the separate area of focus "transport and transport infrastructure development" along with education, medical services market, knowledge-based and high-tech industries is considered a positive moment in the "Strategy" setting.

Development of infrastructure within tasks and ways of functional goals achievement (third level goals) ensuring the implementation of the "Strategy" is presented widely.

The need to stimulate development of the child-minding and child-care market was noted as a task of the city demographic modernization. Nowadays this element of urban infrastructure is not common.

In the sphere of health protection and population's active longevity prolongation the attention was drawn to a network of healthcare institutions development. We believe that this unit traditionally regarded as targeted is infrastructural and is worth noticing only in the context of traditional direction of public health development in the city. Using alternate approaches to the issue, this way of solving a health maintenance problem may be less notable. Thus, the "Strategy" provides a creation of infrastructure for the development of mass physical training and sports activities. As is obvious, one can use different infrastructures to implement the same goal. Therefore, it is important to define a general concept of the goal achievement to frame infrastructure elements formation and provision of its possible combinations.

In the development of the education system, priority is given to the construction and reconstruction of schools and kindergartens. In other words, traditional multi-level education, rigidly divided into levels, is planned to be further developed. In our opinion, this contradicts the idea of lifelong education.

The improvement of the cultural sector is practically devoid of infrastructure support in the "Strategy". An exception is "digitalization" of cultural institutions, which can be considered an element of informational and communication infrastructure.

The necessity of development of social institutions network for senior citizens, people with disabilities (disabled children), women and children in crisis, as well as equipment for most needed facilities in education, culture and sports sectors for people with disabilities was noted in the social support system. Perhaps out of the entire city social subsystem the most attention is paid to the infrastructure in this target block.

The composition of the infrastructure for the functioning and improvement of civil society seems quite fragmentary. It includes only the creation of electronic services for the city population-local government interaction. The same type of

infrastructure provides fire and disaster prevention and social security system improvement. A positive moment in this infrastructure element selection is its high technical and technological level, the disadvantage is its functional limitation.

Improvement of employment is planned without active formation of infrastructure elements. Meanwhile, this sphere definitely requires a fundamentally new infrastructure that provides reformatting of employment in the context of inevitable major structural shifts in the economy.

The development of a high-tech industrial complex provides the improvement of the following infrastructure elements: stimulation of the industrial Internet implementation and creation of engineering infrastructure in areas promising for their development by high-tech industrial enterprises. In this case, based on the characteristics of the city industrial development, a sufficiently diverse infrastructure should be developed. An important feature of planning is the focus on integrated industrial development of territories previously occupied by industrial enterprises, on industrial renovation.

In the development of communication, information and communication technology infrastructure has received increased attention. It is planned to put most advanced networks into commercial operation, to increase total length of fiber-optic transmission lines, the number of Internet-connection ports, and network connection points. Along with other ways to achieve goals in this sphere, the planned infrastructure development has the potential to achieve the planned results.

The planned infrastructure for the sphere of science and innovation includes the formation of specialized means of interactive communication, promising electronic investment sites and business incubators; and allocation of investment sites with innovative technological purpose. Planned infrastructure can potentially provide the city with effective scientific and innovative development.

A key focus of the consumer market and tourism development is the creation of a multi-format trade infrastructure. That does not go far enough taking into account the prospects for the tourism development as a branch of the city economy.

Creation and development of municipal infrastructure facilities is planned as an infrastructure support for the development of small and medium-sized business entities. A planned position is certainly necessary and in terms of existence of a number of small and medium-sized business support projects, can be considered as sufficient.

Provisions characterizing the perspective infrastructure improving contractual (property) and financial relations, establishing Voronezh as a major business center of Russia are not stated in the "Strategy".

The provisions characterizing the improvement of infrastructure in the sphere of spatial development and improvement of the urban environment quality are most represented in the “Strategy”. They include:

- transit-oriented development of the city;
- development of street infrastructure, urban beautification and aquatic compartment, social leisure and public business infrastructure;
- creation of high-speed rail collective transport;
- construction of a belt highway;
- construction of road junctions, bridges (including multi-level), highway interchanges and overpasses;
- allocation of bus-lines;
- development of parking lots;
- arrangement of conditions for self-driving cars;
- highway engineering, including the main urban highways relief roads;
- reconstruction and repair of roads;
- development of an intelligent transport system project and installing its elements for collecting and processing data on vehicles and road infrastructure (traffic flow detectors; adaptive traffic lights; parking meters; information boards; automated lighting control systems; GPS / GLONASS systems);
- construction and arrangement of pedestrian routes and bikeways;
- development of housing and utilities infrastructure;
- balanced development of municipal infrastructure and energy systems in accordance with the needs of the growing city;
- creation of a shared information space that ensures the regular collection and systematization of reliable and relevant information about the municipal infrastructure facilities;
- construction and reconstruction of power supply, water supply, wastewater disposal, gas supply and heat supply facilities;
- operation of housing and utilities infrastructure entities using the State Information System for the Housing and Communal Services;
- elimination of basement boiler stations, completion of the transfer from boilers using fuel oil, diesel fuel or coal as the main type of fuel to environmentally-friendly energy sources;
- “looping” of heat networks with the aim of organizing a continuous heat supply.

IV. CONCLUSION

Summarizing the above one may state that the development of strategic documents of Voronezh, as a typical Russian million-city, changes from a fragmentary vision of the infrastructure as a set of transportation facilities

to its presentation as elements ensuring the spatial and functional unity of the city.

The task of planning the infrastructure support of the million-city's socio-economic development in the spatial development sphere has been solved to the utmost. Its elements are very diverse and include such subsystems as street, transportation, social and recreational, business, utility, energy subsystems. The carriers of these infrastructure elements are diverse as well: specialized and multifunctional spaces, information complexes, automated control systems for industrial, municipal and social facilities, life support facilities for citizens, etc.

A certain lag is observed in the identification and planning of the social sphere infrastructure: education, health care, social welfare and social protection. Fragmentation and focus on traditional forms of functioning is observed in these subsystems of the city.

REFERENCES

[1] Yuri I. Treshchevsky, Valeri P. Voronin, Maria B. Tabachnikova, and Galina N. Franovskaya. Economic and Statistical Analysis in Evaluating the Perspectives of Structural Changes of Regions' Economy. Advances in Intelligent Systems and Computing. Springer International Publishing AG; Cham, Switzerland. 2018, pp. 521-529.

[2] Treshchevsky Y.I., Risin I.E., Korobeynikova L.S., Gavrilov V.V. Management of changes of socio-economic systems: Economic analysis of the state and consequences of the systemic feature Socio-Economic Systems. Springer International Publishing. Editors Dmitry A. Endovitsky; Elena G. Popkova Series Volume 135. 2018, pp. 21-30.

[3] Yuri Treshchevskiy, Sergey Papin, Ekaterina Penina. Structural changes of the consumer market of Russia: from post crisis development to the sanctions period. Proceedings of the International Scientific Conference "Competitive, Sustainable and Secure Development of the Regional Economy: Response to Global Challenges" (CSSDRE 2018). Atlantis Press. Series: Advances in Economics, Business and Management Research. 2018, pp. 449-452.

[4] Treshchevsky Yuri I., Kosobutskaya Anna Yu., Nikitina Larisa. Formation of a Comfortable Urban Environment for Persons with Disabilities in the Strategy of Socioeconomic Development of Voronezh. Proceedings of the 4th International Conference on Economics, Management, Law and Education (EMLE 2018), Atlantis Press. Series: Advances in Economics, Business and Management Research. 2018, pp. 56-59.

[5] Mkrttchian V., Vertakova Y., Treshevski Y., Firsova N., Plotnikov V., Treshchevsky D. "Smart City" — the concept of resolving the contradiction between production and urban life. In: Benna U.G. (ed.) Industrial and Urban Growth Policies at the Sub-National, National, and Global Levels. Hershey, PA: IGI Global, 2018. Chapter 15, 363 p.

[6] V. Plotnikov, Y. Vertakova, Y. Treshchevsky and N. Firsova. Problems of improving the management of socio-economic subsystems in smart cities. International Geotechnical Symposium "Geotechnical Construction of Civil Engineering & Transport Structures of the Asian-Pacific Region" (GCCETS 2018), Yuzhno-Sakhalinsk, Russia, 2018, Article No. 07010.

[7] The strategy of socio-economic development of the urban district the city of Voronezh for the period until 2035. Appendix to the decision of the Voronezh City Council of 12.19.2018 No. 1032- IV. 81 p. Available at: www.gorduma-voronezh.ru/cgi-bin/press.pl/doc/n181219-01032-IV.