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METHODOLOGICAL PROBLEMS

IN DEVELOPMENT OF URBAN CONSTRUCTION AND IMPLEMENTATION OF INVESTMENT STRATEGIES

PROBLEMAS METODOLÓGICOS EN EL DESARROLLO DE LA CONSTRUCCIÓN URBANA Y LA IMPLEMENTACIÓN DE ESTRATEGIAS DE INVERSIÓN

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ABSTRACT

This work focuses on methodological problems of urban construction development and implementation of investment strategy. The main objective of the research is to analyze an investment strategy and to evaluate the effectiveness of selection of justified decisions in development of a city construction based on modern modeling methods. The characteristics of the categories "demand" and "interests" are shown, as the objects of scientific justification for the purpose of stimulating the interests of participants in the construction process. Mutual relations between the investment-construction complex's development strategy and the strategic development of the city were identified. The sequence of step-by-step implementation of the general concept of the city's investment strategy aimed at increasing the efficiency of construction companies is proposed, considering their level of development, and organizational, economic and social factors affecting the city. Organizational-economic modeling is recommended for financing the management and implementation of investment projects.

Keywords: urban construction strategy, economic and social factors, investment funds for development

RESUMEN

Este trabajo se centra en los problemas metodológicos del desarrollo de la construcción urbana y la implementación de la estrategia de inversión. El objetivo principal de la investigación es analizar una estrategia de inversión y evaluar la efectividad de la selección de decisiones justificadas en el desarrollo de la construcción de una ciudad basada en métodos modernos de modelado. Se muestran las características de las categorías "demanda" e "intereses", como objetos de justificación científica con el fin de estimular los intereses de los participantes en el proceso de construcción. Se identificaron relaciones mutuas entre la estrategia de desarrollo del complejo de inversión-construcción y el desarrollo estratégico de la ciudad. Se propone la secuencia de implementación paso a paso del concepto general de la estrategia de inversión de la ciudad encaminada a incrementar la eficiencia de las empresas constructoras, considerando su nivel de desarrollo, y los factores organizacionales, económicos y sociales que inciden en la ciudad. Se recomienda el modelado económico organizacional para el financiamiento de la gestión e implementación de proyectos de inversión.

Palabras clave: estrategia de construcción urbana, factores económicos y sociales, fondos de inversión para el desarrollo

INTRODUCTION

Today, cities are facing increasing environmental, social and economic challenges that together threaten the resilience of urban areas and the residents who live and work there. These challenges include both chronic stresses and acute shocks (Bush & Doyon, 2019). Therefore, making cities more sustainable is one of the most important challenges for humanity (Webb et al., 2018).

In this context urban design discipline emerged as a reaction to the situation of urban planning and architecture relationship with the city. While the planning discipline was more focused on creating solutions that “fits all” for the city, architectural concepts had their focus on the buildings themselves, rather than the relationship with the public realm. Thus, urban design emerged as a bridge between urban planning and architecture (Abd Elrahman & Asaad, 2021).

The development of a city's built-up area, the life of its population, as well as its investment strategy and policy are determined by the availability of a specific economic and social potential. The material source of a city's built-up area is provided by the production structure, which is a totality of economic, industrial, and technological relations that emerge with the development of elements of production (i.e., enterprises and organizations) as well as division of labor. Production structure is the most reliable element of the built-up area. It is shaped under the influence of development of interaction between various fields. The natural and socio-economic environment in the city also influences its formation.

Although the need to make cities more sustainable has been addressed, the role of the construction industry in this process is often not analyzed. In this regard it is important to establish that customers act as main participants of the construction industry. They monitor the execution of construction operations, creation, and sale of the product. Our opinion is that the development of a city's built-up area can be divided into the following:

1. Attraction of investment resources
2. Execution of construction operations
3. Production of building materials, products, and structures
4. System of design and research organizations

The investment resources of the city are formed by: savings of the population, resources of enterprises and organizations, loans issued by banks, foreign investment, and income from the entrepreneurial activity, etc. Special financing – the resources from credit institutions, banks,

investment funds, companies etc. – should be directed towards development of urban construction (Karavaev, 2014, p. 101).

Execution of construction operations creates the end construction product. The creation of the product reflects the operational profitability of buildings and facilities (Magomadov et al., 2016, p. 42) Thus, construction companies (enterprises) and corporations which carry out new construction in the city, expand, reconstruct and repair buildings and facilities try to provide them with minimal operational expenses during their whole life cycle.

Established the importance of the construction industry, the objective of this work is to analyze the methodological problems in the development of urban construction and the implementation of investment strategies.

DEVELOPMENT

Characteristics of government policy in urban construction and construction activity are determined by that policy's socio-economic development priorities. The government policy in urban construction and construction activities aims to provide social and economic development of residential areas, protection of individual rights, prevention of hazards to the life, health and property of population, provision of environmental safety and protection of environment, and protection of historical and cultural monuments (Babayev, 2012, p. 5).

The composition and location of the elements of a city's construction sector directly affect the development of its economic system, determines its production concentration level and the overall strength of separate elements. The rise of the city's economic development has a great impact on the development of its built-up area. A greater change in external factors requires adaptation of socio-economic system and compliance with urbanization documents.

Construction projects must be compatible with urbanization documents, including the requirements of the detailed plan. A consent is given for the implementation of the project, under the presence of mentioned plan or at the completion of the term of its implementation, as well as under the compliance of the construction site with the project planning documents (Master Plan) (Babayev, 2012, p. 7).

Thus, the principle of adaptation constitutes the possible external environment changes and helps to realize corresponding goals and priorities in the built-up area of the city. Therefore, modern urban construction may be shown as a partly self-regulating system which can adapt

to environmental changes with help of various programs, such as government and regional programs, privatization programs, reconstruction programs, social programs etc.

Building materials industry stands at the foundations of the industry division of the construction sector. For example, today very few building materials and structures are being produced in Azerbaijan compared to the 1990s. Therefore, it is important to increase the domestic production of building materials (Babayev, 2013, p. 20).

Production and market are the developed infrastructures of the urban construction. By production we mean machinery repair companies, specialized transport, design and research organizations, and staff training organizations. Banks, territory leasing companies, pricing centers, project inspection organizations, certification organizations, buying and selling (tender) agencies belong to market infrastructure.

Departments, unions, and associations belong to a separate group. External socio-economic and natural factors affect the construction development in a certain degree; therefore, it is purposeful to divide the external factors into two groups.

1. System of factors affecting the development of construction.
2. System of factors characterizing the activity of construction sector in a particular territory, i.e. natural factors – the factors shaping state urban construction policy, which define the specific character of the city.

Thus, Table 1 shows the main functions of participants of urban construction and their organizational forms to provide a complete picture.

Table 1. The main functions and organizational forms of urban construction participants

No	The main participants of urban construction	The main functions of construction	Organizational forms
1.	Investors, customers (builders)	Investing in fixed assets (financing and lending)	- enterprise - individual - banks, credit institutions - local executive power - institutional investors (pension funds, insurance companies, etc.)
2.	Construction designers	Preparation of documents on architectural, construction, and technological assessments	- architectural workshops - design organizations - research organizations
3.	Producers of materials and technical resources	Building materials, products and structures, as well construction machinery and mechanisms, production of energy and other equipment	plants, construction industry enterprises, and workshops
4.	Contractors (companies that carry out construction and installation works)	construction and installation works commissioning of construction products	holdings, corporations, industrial-financial groups, enterprises (companies) with various forms of ownership
5.	Logistics companies	sorting out the incoming materials, packaging, dispatching, and assembly of building materials and constructions etc.	storehouses main bases sorting out organizations consulting companies data centers
6.	Transportation companies that are dealing with material and technical resources	Transportation of material and technical resources	enterprises (companies) with various forms of ownership

The influence of external and internal factors to development of the built-up area has a characteristic of being probable (Nemchin et al., 2012, p. 311). It is necessary to consider the impact of risks and uncertainty in absorption of investments and assessing the efficiency. The optimal activity of urban construction is not possible without the interest of its

participants. Then, the economic interests of the construction subjects have different directions and are contradictory. Mechanisms for replacing such interests should be based on the “demand” and “interest” categories. The methodological model of this study is presented in Figure 1, which shows the main directions of creation of a concept of urban construction management.

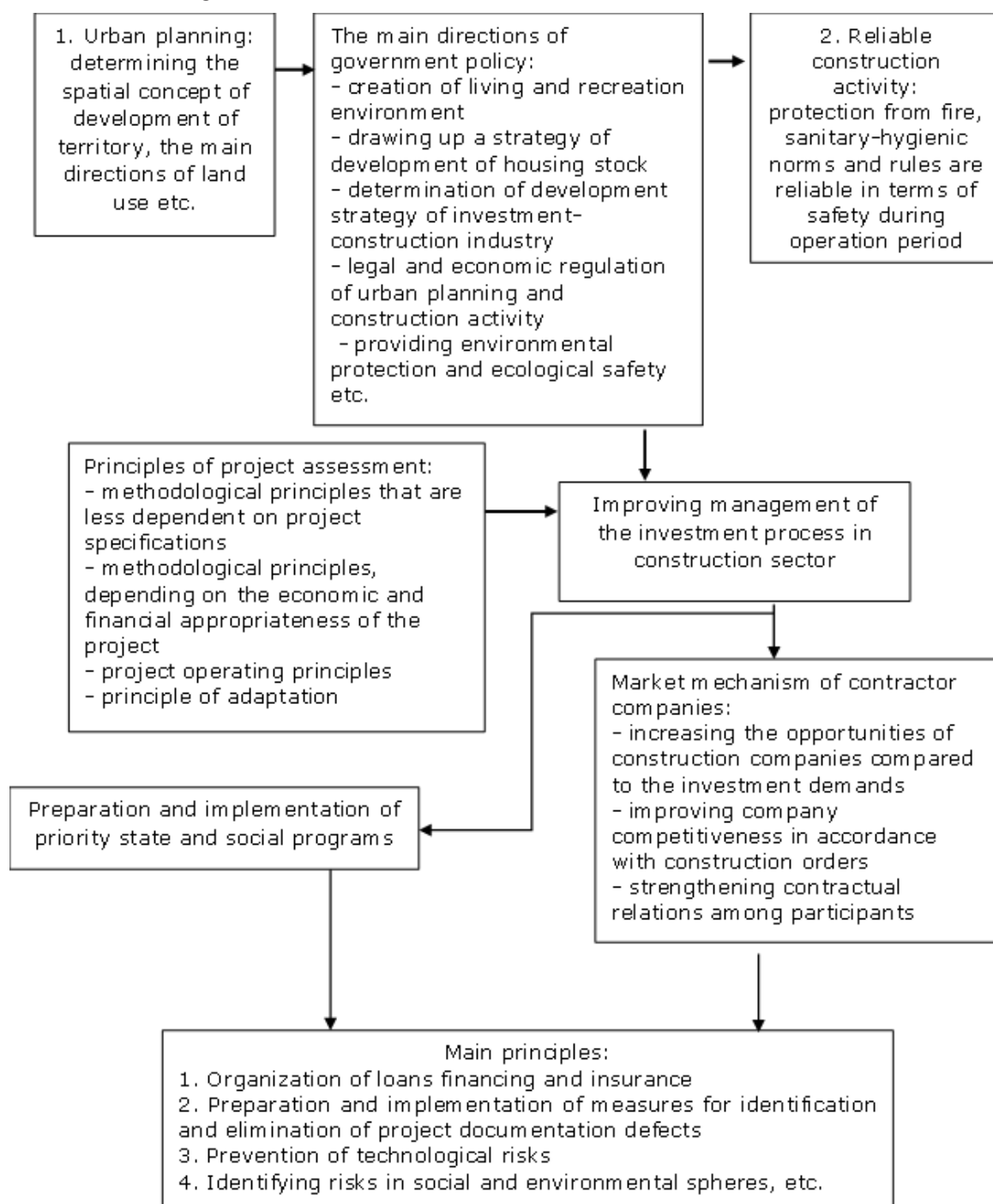


Figure 1. Methodological model of creation of urbanization management concept

The algorithm of changes in economic developments in urban construction is given below:

- the reduction of capital investments during the stabilization phase should be stopped, the volume of construction-installation works should be stabilized at a certain level, this level may also be low due to the increase in the share of the cost of technological equipment in the total cost of capital investments; the payment period of capital investments either decreases or equals the period of the crisis peak
- investment activity grows at the development stage, the volume of capital investments and construction-installation works increases; the payment period of capital investments gradually decreases (Komarova, 2014, p. 127).

In the market conditions it is offered to divide the state regulation of construction sector to the control of public sector of the economy and coordination of non-public sector. The following components may be included to the public control of construction sector:

- preparation of five-year state investment programs.
- facilities and production capacities commissioned based on state orders
- financing of state capital investments via state and local budgets
- continuation of measures to improve the social status of people in need of social protection and improvement of living standards (Budagov, 2017, p. 10).
- additional higher taxes for incomplete construction
- the tax system designed for investors and contracting companies
- creation of a unified price formation system for construction products
- amortization norms for a full restoration of fixed assets (including accelerated standards)
- creation and application of a unified system of labor payment system
- processing and application of new norms of construction period

Control of the public sector and coordination of non-public sector of the built-up area may include the following:

- drawing up forecasts of development of large, medi-

um, and small enterprises in accordance with the recommendations of the executive and local authorities

- realization of amortization allocation in the current account
- application of state amortization norms for full recovery of fixed assets
- improvement of mortgage lending system
- helping to attract local and foreign financial resources to mortgage lending (Najarov, 2015, p. 1).
- insurance of investments for prevention of non-commercial risks
- development of the securities market, investment in housing sector by attracting funds of the population
- realization of projects in accordance with contractor bargains (tenders)
- stimulation of investors (reduction of local taxes) for implementation of investment projects
- attraction of foreign investors by creating a favorable taxation system.

On the other hand, in market economy it is necessary to limit the main management functions at country and city levels for the most effective operation of the construction management system and coordinate those functions at the set level. Under present day conditions, state regulation of investment demand is crucial for the development of investment markets and may include the following:

- application of special tax systems to non-priority types of investment
- reduction of duration of development of new production capacities
- relocation of population from damaged houses to private apartments
- implementation of financing with help of state budget through contract bargains

Also, for the future development of urban construction, it is necessary to stimulate the budget-tax system and credit policy, apply administrative methods of regulation, and strengthen the competition in contract works.

The investment strategy of the city should be aimed at an efficient management of the built-up area and realization of programs. Therefore, the investment strategy should provide the following:

- the improvement of relations between government, investors, construction enterprises, public organizations and others for development and reconstruction of the city.
- achieving an efficient cooperation between government, municipalities, special and public organizations.

In addition, attraction of investments into the economy plays an important role in securing a long-term economic and social development of the city. Therefore, improvement of the investment climate is one the most important tasks for securing the needed volume and quality of investments (Budagov, 2017, p. 17).

In order to shape the market environment under the city's investment strategy it is necessary to create a monitoring system for the activities of the built-up area. That system should include the following:

- receiving information about the socio-economic processes in the built-up area
- analyzing and evaluating the received information.
- preparation of measures for detection of the factors that have a negative impact on the built-up area and their prevention.
- the city's investment strategy should direct to the efficient management of the construction site and implementation of the programs.
- provision of governing bodies, enterprises, departments, and citizens with information obtained from monitoring.
- organization of a unified information support system to ensure the adoption of appropriate decisions in urban planning and construction (Babayev, 2013, p. 10).
- drawing up forecast of social and economic development in urban built up area.
- preparing recommendations to help eliminate flaws (Budagov, 2017, p. 11).

During preparation of the city's investment strategy, drawing up forecasts on economic indicators of the built-up area's enterprises could be helpful for making management decisions. One can use statistical series of dynamics, studying the patterns of development of the construction sector, with the purpose of analyzing the level of development of production over a certain period of time (Budagov, 2017, p. 31). Growth rate, increase rate (downturn), absolute growth, average growth rate, average increase rate, and other parameters are used for dynamics analysis.

An interesting and useful model to consider is matrix model, which provides six parameters. Based on systemic approach, these parameters are shown in Table 2, where they refer to input, output, and process. Labor volume is given in the second line of the matrix, in the third – stock volume, in the fourth – material capacity (labor goods), in the fifth – prime cost, in the sixth – construction products volume and in the seventh – profit volume. In accordance with the above diagonal of the table (with a value of cells equal to 1) its opposite value is being inscribed, horizontally to the left of the corresponding element of the diagonal.

Table 2. Growth parameters of the construction operations development (matrix model)

Matrix parameters	Input parameters			Process parameters	Output parameters	
	Growth of the labor force ΔF	Increase in fixed assets ΔFA	Increase in labor goods ΔLG	Reduction of the prime cost of construction products ΔIC	Increase of construction products ΔI	Increase in profit ΔIP
1	2	3	4	5	6	7
Growth of the labor force ΔF	1	$\frac{\Delta F}{\Delta FA}$	$\frac{\Delta F}{\Delta LG}$	$\frac{\Delta F}{\Delta IC}$	$\frac{\Delta F}{\Delta I}$	$\frac{\Delta F}{\Delta IP}$
Increase in fixed assets ΔFA	$\frac{\Delta FA}{\Delta F}$	1	$\frac{\Delta FA}{\Delta LG}$	$\frac{\Delta FA}{\Delta IC}$	$\frac{\Delta FA}{\Delta I}$	$\frac{\Delta FA}{\Delta IP}$

Increase in labor goods ΔLG	$\frac{\Delta LG}{\Delta F}$	$\frac{\Delta LG}{\Delta FA}$	1	$\frac{\Delta LG}{\Delta IC}$	$\frac{\Delta LG}{\Delta I}$	$\frac{\Delta LG}{\Delta IP}$
Reduction of the prime cost of construction products ΔIC	$\frac{\Delta IC}{\Delta F}$	$\frac{\Delta IC}{\Delta FA}$	$\frac{\Delta IC}{\Delta LG}$	1	$\frac{\Delta IC}{\Delta I}$	$\frac{\Delta IC}{\Delta IP}$
Increase of construction products ΔI	$\frac{\Delta T}{\Delta F}$	$\frac{\Delta T}{\Delta FA}$	$\frac{\Delta T}{\Delta LG}$	$\frac{\Delta T}{\Delta IC}$	1	$\frac{\Delta T}{\Delta IP}$
Increase in profit ΔIP	$\frac{\Delta P}{\Delta F}$	$\frac{\Delta P}{\Delta FA}$	$\frac{\Delta P}{\Delta LG}$	$\frac{\Delta P}{\Delta IC}$	$\frac{\Delta P}{\Delta I}$	1

Three parameters refer to input:

- increase in staff and labor force ΔF .
- increase of fixed assets ΔFA .
- increase of labor goods (material services) ΔLG .

The process parameters include reduction of the prime cost of construction products ΔIC . Output indicators include increase of construction products ΔI and increase of profits ΔIP . As the effectiveness of construction operations improves, the output indicators should go down. In some cases, when one resource is replaced by another, there is an intensive increase in one factor due to the intensive use of the other (Kovalsky, 2013, p. 132). For example, when the level of mechanization of construction work increases, the value of the main production assets grows rapidly, in comparison with the volume of the work performed, i.e., $\Delta FA > \Delta I$. In this case, labor productivity increases, i.e., $\Delta F < \Delta I$. As a result, the ratio of the value of fixed assets and working capital given in advance stabilizes with the growth of profits.

The growth indicators of construction operations in matrix model change are: fund income and fund capacity, labor capacity and labor productivity, material capacity and material income, etc. To get a model that identifies the role of each factor in development of construction operations, the matrix should be processed mathematically in the future. Thus, the monitoring of activities in the built-up area is imagined as a chain: analysis – development of a program – achieving the goal of development of construction operations. Monitoring should also be systematic, comprehensive, and purposeful (Kondratev, 2014, p. 47).

Respect to the concept of the city's investment strategy on development of construction companies, it is proposed to divide it into the following stages:

1. Determining the effectiveness of construction companies:
 - assessment of the impact of different groups of outer and inner environment under complex approach system.

- determining the impact of risks in the activity of those groups in different circumstances.
2. Development of resource policy of construction companies:
 - effective provision of resources in specific organizational and economic conditions.
 - determining the efficiency of activity of construction companies through the use of effective technologies for development of construction.
3. Ensuring the timely construction of facilities by spending fewer losses.
4. Determination of development and prospective situation of phases of the life cycle of a construction enterprise by taking into account the degree of its flexibility:
 - efficient development of all types of production processes in construction enterprises.
 - taking into account the possibility of changes in the enterprise's potential at various stages of the construction cycle.
5. Determining the effectiveness of different stages of the life cycle of a construction enterprise, based on its existing potential:
 - determining the volume of necessary investments and general expenses for the construction of facilities.
6. Organization and implementation of the investment policy of the relevant enterprises in attracting investments in the construction industry and the formation of its reliable structure.
7. Evaluation of effectiveness of an enterprise in determining specific organizational and economic parameters (Babayev, 2016, p. 83).
8. Combining the results of activities of construction industry enterprises united as an alliance based on share investments (Jabbarov, 2015, p. 31).

It is also important and necessary to identify the reasons for emergence of additional costs on formation of changes

in the course of implementation of investment projects. In the absence of investment resources, the effectiveness of their use is currently considered as the most important issue. When developing an investment strategy, it is necessary to take into account the factors and stages which are described above. In our opinion, the management of all phases in the life cycle of a project must be consistent and systematic. An organizational and economic model of financial support for the implementation and management of project results has been developed.

The organizational-economic model enables the renewal of the real process of value formation, prediction of its level, and makes necessary adjustments that condition the changes in its environment in the project implementation process (Kaspin, 2016, p. 42). The use of the model will allow achieving a planned outcome (or minimizing negative changes) in the efficient use of restricted financial resources. Thus, the proposed model forms the possibility of optimal management of the assessment of the behavior of participants in the construction process, as well as of investors who fund the project.

Management of the model includes project costs, value, and financial guarantee.

1. Project cost management includes:

- completion of drawing up estimate costs on the project
- financial resources
- preparation of an effective cost plan for project implementation
- organization of control on execution of expenses under project documentation (Grinchel & Kostyleva, 2014, p. 29).

Elimination of subjective causes of actual costs and keeping record of objective causes allow predicting the effect of changes in the project value.

1. The cost management includes:

- determination of the price level of the final construction product in accordance with the project cost plan and profit
- detection of change in value and cost correction during project implementation (Petrov, 2013, p. 147).

2. Management of financial support includes:

- determination of financing in accordance with the initial costs plan for the implementation of the project
- inclusion of additional expenditure in financing from

various sources and making appropriate adjustments to the expenditure plan

- adjusting finance the remaining part of the project during its implementation. A description of the functions of the model shows that problem solving takes place in close interactions that provide the current monitoring (Kochetkov, 2014, p. 217).

The following is a sequence of investment-building project financing activities, namely planning and production. Planning includes two stages, and production includes all three stages.

The first stage includes:

- drawing up the project estimate. Selection of favorable sources of financing for the investor.
- determination of the value of the construction product.
- calculation of prices for the sale of construction products.
- evaluation of the effectiveness of the investment project.

The second stage includes:

- distribution of costs in accordance with time.
- formation of the initial plan of the project costs.
- predicting the cost of the construction product according to obtained plan.
- prediction of the price dynamics and the price of construction product.
- assessment of project effectiveness in terms of good return rate for the investor (Sharpe et al., 2014, p. 275).
- t stage optimal plan for realizing the project.

The third stage includes:

- organizing of a plan and accounting of actual costs
- detection and keeping record of a deviation from the intended plan (Zuckerman & Blevins, 2015, p. 176).
- making changes in accordance with the initial plan of costs, taking into account the impact of changes in project results.
- determination of the amount of project financing for cash inflow.
- drawing up a financial plan of the project.

To this point the ways and methods of improving the management and execution of tasks for the solution of the socio-economic and environmental problems in urban construction have been identified. Thus, the current system of management should provide for the improvement of the efficiency of urban construction. Then, when dividing implementation of the overall investment strategy into stages, it helps predicting the economic performance of construction enterprises will help take managerial decisions.

Implementation of the concepts and models discussed in the above-mentioned directions will play an important role in achieving the goals set in the socio-economic development of Baku as well as in improving the well-being of the urban population. It is advised to senior and mid-level managers working in the construction sector to take into account the above-mentioned methodological models and to use an investment strategy aimed at improving the efficiency of construction enterprises taking into account the socio-economic and organizational conditions.

CONCLUSIONS

The production structure constitutes the material basis of urban construction and its developed infrastructure. It is formed under the development of interactions between various fields and the impact of natural and socio-economic environment. The author suggests that the external factors affecting the development of the construction be divided into two groups in terms of the adaptation of the socio-economic system in their modification. Also, it is believed that the control of state sector of the built-up area and the coordination of the non-state sector, and the identification of their components should be taken into consideration in state regulation.

Development of urban construction and its concept implies the proper compilation and evaluation of investment programs. For the effectiveness of investment programs if the state has low budget funds, the re-investment mechanism should be upgraded, and the budget expenditure spent on urban construction should be repaid.

Urban construction should take into account long-term forecasting of building production growth and requirements put for construction products (residential houses, facilities, etc.). It is recommended that the development of urban construction includes the following: 1) a methodological model for creating a concept of urban construction management, 2) the implementation of the general concept of investment strategy, 3) the matrix model of the development of construction operations, 4)

organizational-economic model of financing project management and implementation, 5) an algorithm for the management and implementation of investment-construction project.

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