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### THE DEVELOPMENT OF THE CAPITAL CITY INFRASTRUCTURE WITHIN THE AGGLOMERATION

**Annotation:** The analysis of the state and prospects of development of infrastructure of Nur-Sultan within the formation of Nur-Sultan agglomeration is carried. The key aspects of agglomeration development presented as the basis of spatial planning of regional policy are identified. The world experience of management of urbanization processes is interrelated with the current disproportions of regional development of Kazakhstan on the basis of the indicated positive prerequisites for the use of the model of agglomeration development of the capital and adjacent territories in the direction of specialization as a transport and logistics hub. The main directions of modernization of engineering and communication and transport infrastructure focused on creating an incentive for the territorial concentration of production and labor resources in the Nur-Sultan agglomeration are given, taking into account this vector of development.

**Keywords:** agglomeration development, regional economic policy, transit potential, infrastructure, agglomeration, agglomeration process, infrastructure projects, transport logistics.

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### РАЗВИТИЕ ИНФРАСТРУКТУРЫ СТОЛИЧНОГО ГОРОДА В РАМКАХ АГЛОМЕРАЦИИ

**Аннотация:** Проведен анализ состояния и перспектив развития инфраструктуры города Нур-Султан в рамках формирования агломерации Нур-Султана. Обозначены ключевые аспекты агломерационного развития, представленные как базис территориально-пространственного планирования региональной политики. Мировой опыт управления урбанизационными процессами взаимоувязан с текущими диспропорциями регионального

развития Казахстана на базе обозначенных положительных предпосылок использования модели агломерационного развития, столицы и прилегающих к ней территорий по направлению специализации как транспортно-логистического хаба. С учетом данного вектора развития приведены основные направления модернизации инженерно-коммуникационной и транспортной инфраструктуры, ориентированные на создание стимула для территориальной концентрации производственных и трудовых ресурсов в агломерации Нур-Султана.

**Ключевые слова:** развитие агломерации, региональная экономическая политика, транзитный потенциал, инфраструктура, агломерация, агломерационный процесс, инфраструктурные проекты, транспортная логистика.

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## АГЛОМЕРАЦИЯНЫН АЛКАГЫНДАГЫ КАПИТАЛДЫК ШААРДЫН ИНФРАКУРАМЫН ӨНҮКТҮРҮҮ

**Аннотация:** Нур-Султан агломерациясын түзүүнүн алкагында Нур-Султан шаарынын инфраструктурасынын абалын жана өнүгүү келечеги жөнүндө талкуу жүргүзүлдү. Анда аймактык саясатты, аймактык-мейкиндигин пландаштыруу базасы катары берилген агломерациялык өнүгүүнүн негизги аспектилерин белгиленген. Дүйнөлүк тажрыйбадагы башкаруун урбанизациялык процесстертерине байланышуусу менен, учурдагы диспропорцияланган аймактарды өнүктүрүү Казакстандын базасында белгиленген оң өбөлгөлөрдү пайдалануу моделдерин агломерациялык өнүктүрүү борборунун жана ага жанаша жайгашкан аймактардын багыты боюнча адистештирүү катары транспорттук-логистикалык хаба тарабынан жайгашкан. Өнүгүүнүн ушул векторун эске алуу менен, Нур-Султан агломерациясында өндүрүштүк жана эмгек ресурстарынын аймактык топтолушуна стимул түзүүгө багытталган инженердик, коммуникациялык жана транспорттук инфраструктураны модернизациялоонун негизги багыттары келтирилген.

**Ачык сөздөр:** агломерацияны өнүктүрүү, аймактык экономикалык саясат, транзиттик потенциал, инфраструктура, агломерация, агломерация процесси, инфраструктуралык долбоорлор, транспорттук логистика.

**Introduction.** The development of the country as a whole and its individual regions largely depends on a number of factors that create the necessary conditions for the realization and increase of economic potential, ensuring productive employment and a high standard of living of the population. A special role is played

by the infrastructure complex, which largely reflects the growth rate of the region's productive forces.

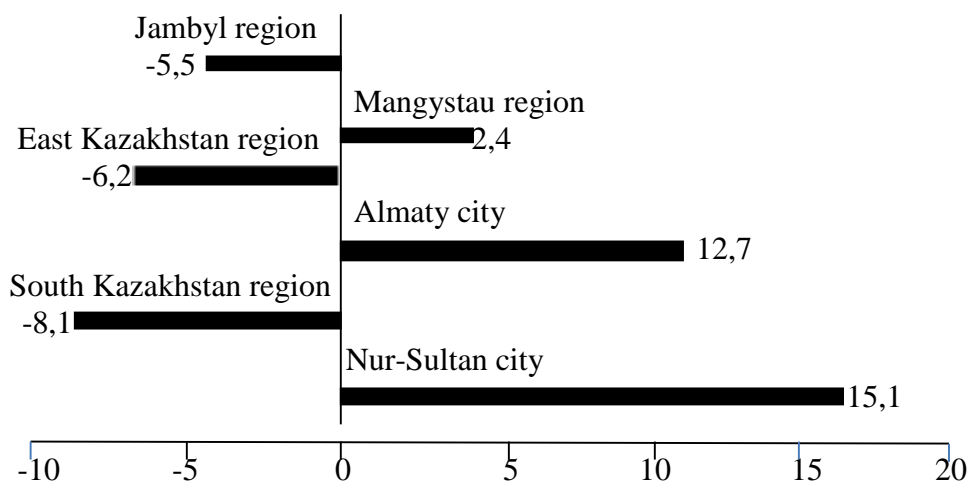
It should be noted that the degree of spatial development of cities, regions or territories is a comprehensive assessment of the state of engineering, communication and transport infrastructure.

**Problem statement.** There is a directly proportional dependence of the level of competitiveness of the region and the development of its infrastructure in this aspect. This is due to the high level of investment to provide the territory with the necessary communications, i.e. to involve it in the economic turnover as a spatial resource. Often, the «unpresentable» state of the territory becomes the reason for the inexpediency of implementing even a very profitable investment project.

As spatial resources are exploited more intensively and their available reserves are reduced, the very fact of owning them can bring a growing income depending on the quality of the organization of this particular space. We are talking about the direct use of space as such, and those types of exploitation in which its material content is put to the fore [1, p.25].

Generally, the development of the modern settlement system is the most important problem of territorial planning of many States characterized by unbalanced development of the territory, the rapid growth of large cities while the «extinction» of small towns and rural settlements. This, in turn, negatively affects the state of ecosystems, leads to a reduction in recreational resources and exacerbation of social problems due to uncontrolled migration flows [2, p.132]. This problem is also relevant for the Republic of Kazakhstan.

**Research result.** This trend can be traced by drawing attention to the balance of migration of different regions of Kazakhstan (Picture 1). The largest positive balance of migration was noted in Nur-Sultan – more than 15 thousand people, Almaty-about 12.7 thousand people and Mangystau region-about 2.4 thousand people. The outflow takes place in South Kazakhstan (-8.1 thousand people), East Kazakhstan (-6.2 thousand people) and Zhambyl (-5.5 thousand people) regions, according to the statistics Committee of the Ministry of national economy of Kazakhstan, in January–September 2018.



Picture 1. Migration balance of certain regions of Kazakhstan for January-September 2018, thousand people.

Рисунок 1. Сальдо миграции отдельных регионов Казахстана за январь-сентябрь месяцы 2018 г., тыс. чел.

Сүрөт 1. 2018-жылдын январь-сентябры үчүн Казакстандын айрым региондорунун миграциясынын сальдосу, миң адам

Compiled by the author according to [2].

At present, Kazakhstan has all the necessary conditions and prerequisites for agglomeration development, due to demographic and geographical, as well as economic and political factors. The urbanization rate in Kazakhstan is about 54-55%, which is the highest for the countries of Central Asia, but far behind the developed countries the urbanization Rates of countries such as Australia, Canada and the United States, determined by the same method, are in the range of 70-80% according to The Agency of statistics of the Republic of Kazakhstan and the world Bank.

As noted in the program of development of regions of the Republic of Kazakhstan until 2020, growing cities, increasing mobility of the population and increasing specialization of production are integral companions of development. These changes are particularly noticeable in North America, Western Europe and northeast Asia. However, the countries of East and South Asia and Eastern Europe are undergoing similar changes in scale and pace.

The problem of disproportions of regional inequality is relevant for many States. Its characteristic feature is that it covers many areas of public life, strengthening the crisis trends in the economic, political and social spheres. Inter-regional inequality is profound, as it is caused by the natural and historical aspects of each region. Modern world conditions of public life require the activation of the state to develop programs aimed at smoothing interregional disparities [3, p. 48].

The uneven level of regional development leads to social tensions, migration of skilled personnel and capital to more developed regions, which hinders the growth of "poor" regions. First of all, it is manifested in the standard of living of the population. A rational and effective policy of smoothing regional inequality should include measures in the social and institutional sphere aimed at increasing human capital, targeted social assistance to vulnerable groups of the population, since human capital is the main asset of any state.

The modern regional policy of the Republic of Kazakhstan is developed within the framework of the theory of «poles of growth», i.e. it is based on the idea of forming agglomerations and single-industry towns. It is designed to provide productive employment and increase the competitiveness of the regions, which is determined by the degree and efficiency of the use of natural, raw materials, labor, infrastructure potential.

In this aspect, it should be noted that in General, agglomeration processes in the region are characterized by economic relations between producers, the development of which ensures the emergence of centripetal forces that pull labor resources into concentrated business centers. This creates a need for workers in

expensive housing in the business district or to make daily trips to economic centers from the periphery.

World practice shows that the development of agglomerations allows to concentrate the economic and labor potential of the country, thereby ensuring the formation of economic development zones. Agglomeration process is the concentration of economic activity in a region (city) in dynamics. Agglomeration effect implies an economic benefit from the concentration of business activity, which is due to the emergence of external savings for the objects included in the concentration, reducing production costs due to economies of scale, increasing productivity, attracting related firms to the region's industries [4. p. 234].

Results of the original author's research: Regionalization is one of the current trends in the development of the world economy, increasing the role of territories in economic life, expanding the powers of management structures. This determines the formation of a regional development strategy, which takes into account, on the one hand, the specifics of territorial reproduction, the combination of socio-economic and natural resource components, on the other – the interaction of macroeconomic and local economic cycles.

Infrastructure, which is the result of social development, plays a significant role in regional development. At this stage, scientific and technological progress provides a new qualitative level of existence of society and the dominance of certain sectors of the economy. The content of the infrastructure is determined by the internal economic unity of its constituent industries and functional purpose [5, p.58].

The SWOT analysis presented in the table reasonably takes into account the high level of wear and tear of engineering and communication infrastructure as one of the weaknesses of Nur-Sultan development (Picture 2). Worn-out network and the sources of public services are the cause of frequent accidents and crisis situations, rapid growth rates due to the use of inefficient and obsolete equipment, and significant losses during transportation to the end user that the water be about 18.5 percent, heat supply – of 13.75%, electricity – by 13.3%.

The high degree of deterioration of utility networks and roads of Nur-Sultan at the moment is a significant problem, the solution of which in the framework of the formation of the Nur-Sultan agglomeration is of paramount importance.

Table 1

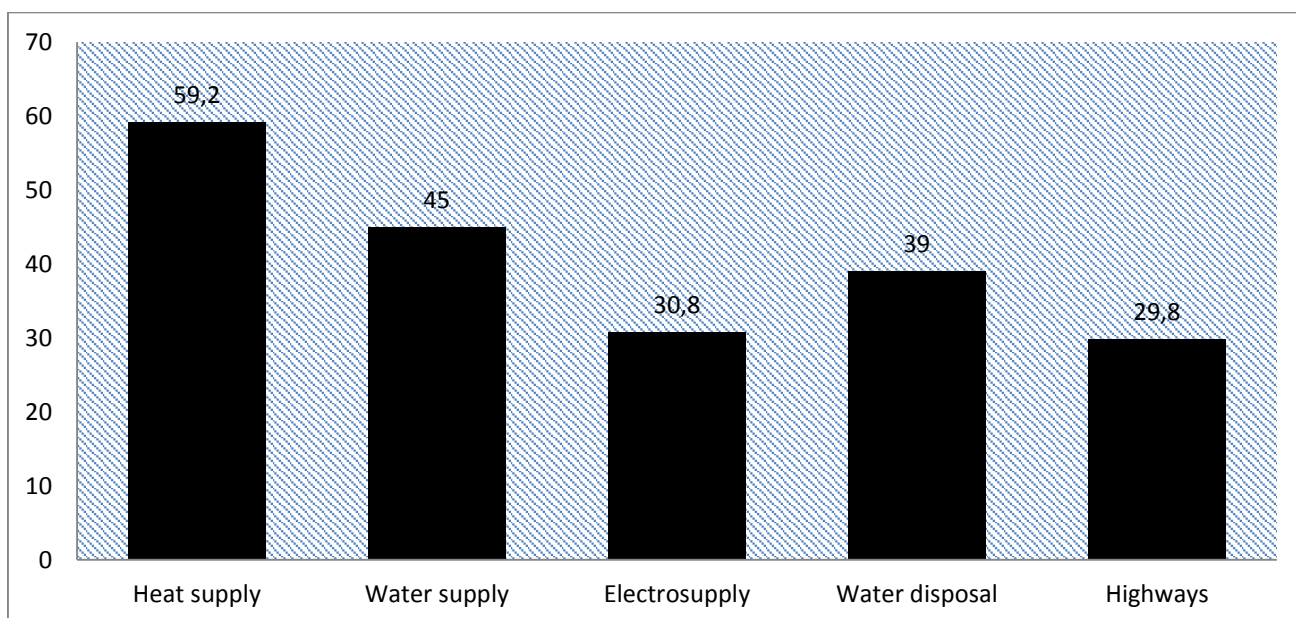
SWOT-analysis of the spatial location of Nur-Sultan, taking into account the climatic and transport and logistics conditions of the adjacent agglomeration areas

SWOT-анализ пространственного расположения Нур-Султана с учетом климатических и транспортно-логистических условий прилегающих агломерационных территорий

Кесте 1. Агломерациянын чектеш аймактарынын климаттык жана транспорттук-логистикалык шарттарын эске алуу менен Нур-Султан мейкиндигинин жайгашуусун SWOT-талдоо

Opportunities	Threats
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Strength	<p>The absence of natural obstacles in the expansion of the city.</p> <p>No threat of earthquakes, mudslides, landslides and hurricanes.</p> <p>Low level of air pollution due to strong steppe winds.</p> <p>Location in the center of the Republic</p>	<p>Migration inflow.</p> <p>Poorly developed infrastructure of waste processing and disposal.</p> <p>Discharge of polluted water into the Yesil river by agribusiness enterprises in the areas where the riverbed runs</p>
Weakness	<p>Significant distance from major cities of Russia and China.</p> <p>High level of wear of engineering and communication infrastructure.</p> <p>Mismatch of the capacity of the main land routes to the increasing transit flow.</p> <p>Poorly developed air communication network</p>	<p>Limited capacity to supply the population's increasing drinking water needs.</p> <p>Large temperature difference during the year (-45 to + 40 °C)</p>
Compiled by the author according to [5].		



Picture 2. The degree of deterioration of engineering, communication and transport infrastructure of Nur-Sultan as of January 1, 2018, %

Compiled by the author according to [5].

Рисунок 2. Степень износа инженерно-коммуникационной и транспортной инфраструктуры г. Нур-Султан по состоянию на 1 января 2018 г., %

Составлено авторами по [5].

Сүрөт 2. Нур-Султандын Инженердик-коммуникациялык жана транспорттук инфраструктурасынын 1-январга карата эскирүү деңгээли, 2018 ж., %

Авторлордун айтымында [5].

Currently, a Comprehensive plan of socio-economic development of the outskirts of Nur-Sultan (residential areas of 19 former settlements with a total area of 4,168 hectares and a population of about 109.4 thousand people) for 2014-2020 is being implemented, according to which 398.12 km of roads and 1,520.82 km of engineering networks, as well as 112 engineering structures (transformer substations, sewage pumping stations and treatment facilities) are planned.

Nur-Sultan agglomeration includes three districts of the adjacent region-Arshalynsky, tselinogradsky and Shortandinsky, included in the 1.5-hour isochrona of transport accessibility.

The above areas are among the largest in terms of population in Akmola region and against the background of population decline in other regions of the region (Astrakhan, Atbasar, Enbekshildersky, Ereymentau, Esil, Zhaksynsky, Zerendinsky, Korgalzhynsky, Sandyktausky) are characterized by positive demographic dynamics. Moreover, the basic population growth, especially in the Tselinograd district, is ensured due to the high level of migration inflow to the settlements of these areas from the agglomeration zone. The proximity of the capital and its socio-economic development allow predicting further population growth in the surrounding areas of the region.

According to official statistics, as of January 1, 2018, the total population of the three districts (115 settlements) amounted to almost 119 thousand people, or 16% of the total population of the region.

In the total population of the agglomeration zone, the number of employed three districts (143 thousand people) amounted to more than 89 thousand people, of which the daily labor migration to the city of Nur-Sultan is 46 thousand people (52%).

In the regional context, the largest pendulum migration falls on the Tselinograd district, 59% of the employed population of which carry out labor activities in the capital.

This trend is primarily due to the proximity of the capital, which causes an outflow of able-bodied population to the center of the agglomeration, especially young people, due to higher wages of working specialties and high demand for labor in the construction and repair labor market.

Another reason is the low infrastructure provision of the districts, the lack of job offers to ensure employment of the rural population.

Thus, in the cities of Akmola region, located within the boundaries of the Nur-Sultan agglomeration, the wear of electric networks is on average 85%, heat-80%, water-70%, the accident rate of housing varies from 10 to 20%.

At the same time, being under the influence of Nur-Sultan, the settlements of the suburban zone have opportunities for free growth and independent development, due to both the natural resource potential of the territories and the existing industry specialization.

The main part (more than 60%) of the deposits of common minerals is concentrated on the territory of the three named regions.

Agriculture is the main activity of the population of the areas of the agglomeration zone, there are significant areas for the development of crop production and livestock (stall and pasture). The high demand for food, the implementation of the Food belt around Nur-Sultan are the most important factors in the development of the potential of agriculture.

In the industrial sector, taking into account the formed specialization of the development of industries, promising areas are the food industry, construction

industry, woodworking, production of rubber and plastic products, mechanical engineering and Metalworking.

In our opinion, given the availability of transit potential, it is promising for the adjacent areas of the agglomeration zone to develop the service sector, as well as to take a set of measures to increase the production potential of the regional economy.

The projects need to be directed at the development of agricultural production, including agro-processing, construction of vegetable stores, the expansion of production construction materials, creation of new objects of the service sector.

Currently, 67 projects with a total investment of 30.9 billion tenge are planned to be implemented in the areas of the agglomeration zone, which will create an additional 1,910 permanent jobs.

In addition, in order to develop the processing industry in the capital, it is advisable to implement agro-industrial projects in three districts of the agglomeration zone. Given the high pace of construction in Nur-Sultan and the constant demand for building materials, enterprises of the districts plan to implement 17 construction projects.

In Arshaly district, a large and promising project is the creation of a joint venture for breeding the ancestral flock of poultry meat direction in the village of Zhibek Zholy. In Shortandinsky district-construction of a feed mill at the station Tonkeris.

As for the core of Nur-Sultan agglomeration, in accordance with the main provisions of the adopted program documents, a set of measures to improve the energy efficiency of the housing stock is planned through the phased repair of condominium facilities, energy audit of residential buildings, transition to energy-saving technologies. As part of the development of Nur-Sultan agglomeration, living conditions will be created for the growing population, including on the outskirts of the city: modernization of the municipal (gas, heat, electricity, water supply systems) and housing sectors, construction of affordable housing, further diversification of the economy, strengthening of entrepreneurial potential.

In addition, the implementation of such major infrastructure projects as the construction of roads «Western China – Western Europe», Nur-Sultan Almaty, Almaty-Aktobe-Atyrau, Nur-Sultan-Ust-Kamenogorsk, the construction of a new airport and railway station, are steps to further develop the transport potential of Nur-Sultan and create momentum for the development of business activity of the population.

In this aspect, a special role is played by the spatial and territorial location of Kazakhstan, its transit potential, which acquires a strategic character within the framework of the functioning of the Eurasian economic Union [6].

At the same time, given that Nur-Sultan is located in the center of the Republic, at the intersection of all key rail and road highways, it should be noted the paramount importance of the development of the transport and logistics system of the Nur-Sultan agglomeration.

Relevant projects are already being implemented in this direction. Thus, in 2017, more than 90 km of main railway tracks were repaired within the boundaries



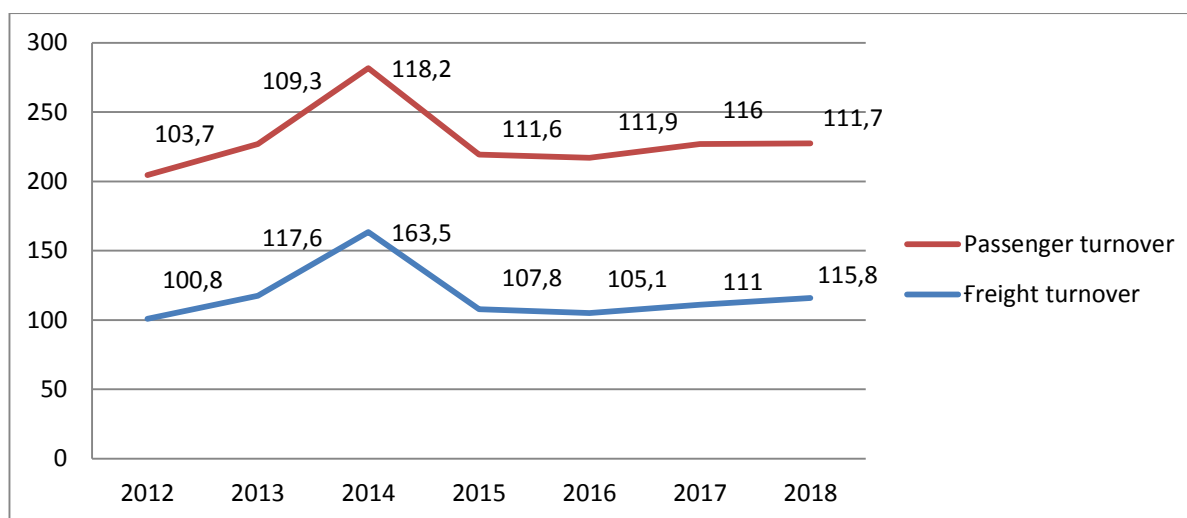
of the Nur-Sultan agglomeration, 14 stations were built and 10 stations were overhauled, a high-speed electric train of increased comfort was launched with the message «Nur-Sultan-Borovoye-Kokshetau». This year, high-speed traffic «Nur-Sultan-Shymkent» was also added. A new station is being built, the capacity of which, according to preliminary forecasts, will be more than 40 passenger trains per day by 2019. As well as a large transport and logistics center at the station «Fortieth» (road, rail, aviation) [7, p 124].

According to preliminary estimates, the funds invested in the development of transport and logistics infrastructure in the near future will increase the volume of transit traffic through Kazakhstan twice and bring it to 50 million tons. In the future, Kazakhstan should become the largest business transit hub of the Central Asian region, a kind of bridge between Europe and Asia [8, p.122].

It should be noted that according to the results of a study conducted by the World Bank, Kazakhstan in 2018 on the logistics development index (LPI) took 88th place, despite the fact that in 2007 this indicator was at the level of 133rd place. Thus, for 7 years our country has improved its position by 45 points. Within the framework of the State program of development and integration of the infrastructure of the transport system of the Republic of Kazakhstan until 2020, the country has already set another bar – to improve this indicator to the 40th position.

In turn, Nur-Sultan's use of the country's transit potential will allow the economy to develop properly. After all, thanks to Railways and roads, it is possible to expand production, increase capacity and increase trade both within the country and abroad. And in this case, an effective transport infrastructure is the key to the successful development of the country's economy as a whole, and its leading segments [9, p.69].

Analysis of the development of the main indicators of transport in the capital indicates a growing amount of economic effect from the development potential of the sector of transport and logistics services (Picture 3). Thus, at the end of 2013, the volume of services rendered in the field of transport and warehousing amounted to 330.2 billion tenge, which is 35% higher than in 2008 (245 billion tenge). At the same time, the volume of passenger traffic annually grows by an average of 10-15%, cargo turnover – by 8-12%. Thus, in 2014, the volume of cargo turnover amounted to 7,866 million tkm, which is 3 times higher than in 2008. (2 636,3 million tkm), the volume of passenger traffic increased by 2 times – from 7 634,9 million to 15 802,8 million PKM.



Picture 3. Dynamics of indicators in the sphere of transport of Nur-Sultan in 2012-2018, %  
Compiled by the author according to [9].

Рисунок 2. Степень износа инженерно-коммуникационной и транспортной инфраструктуры г. Нур-Султан по состоянию на 2012-2018 гг., %  
Составлено авторами по [5].

Сүрөт 2. 2012-2018-жылдардагы абал боюнча инженердик-коммуникациялык жана транспорттук инфраструктуранын эскирүү деңгээли, %  
Авторлардун айтымында [5].

**Conclusion.** It is worth noting that infrastructural development is directly related to the welfare of the population, as the projects will promote the opening of major new facilities, create jobs and improve social infrastructure, with the growth of spectrum and quality of services provided to SMEs [10, p.8]. To date, the infrastructure development of the country is determined by the State program for the development and integration of the infrastructure of the transport system of the Republic of Kazakhstan until 2020, positioning the development of Nur-Sultan as a Northern cluster of logistics services, focused on creating an incentive for the territorial concentration of production and labor resources in "growth points", economically promising and favorable for life areas.

At the same time, the development of large urban agglomerations for Kazakhstan is a new project, which is part of the long – term development strategy of the country and its capital. In this regard, it is advisable to take into account the international experience of urban planning and infrastructure development and the formation of a full-fledged system of suburbs (for example, «Greater Tokyo», «Greater London», «Greater Paris»).

The legislative acts of the country, including the definition of the mechanism of integrated management of the agglomeration development, also require appropriate changes.

Today, the development of a long-term Concept containing project proposals for spatial levels, boundaries, structure (planning, transport framework) of the Nur-Sultan agglomeration, including the city of Nur-Sultan and Akmola region, providing for zoning of the territory, the definition of consolidated indicators of the prospective distribution of population and jobs in the planning zones, as well as the organization of a multifunctional zone, etc., is also relevant. The implementation of

these initiatives will not only bring the engineering infrastructure of the outskirts of Nur-Sultan to the urban level, but also create an appropriate multiplier effect of the development of the agglomeration areas adjacent to the city.

#### REFERENCES:

1. Iskakov N. Sustainable development: breakthrough ideas and technologies [Text] / N. Iskakov, Moscow: RAEN, 2009, p. 25.
2. Firsova, N. A. Problems of international labor migration: political and legal aspects [Text] / N. A. Firsova // Bulletin of KRSU, 2010, №1, p. 132-137.
3. Fateeva S. V. Tools for analysis of disproportions in the development of territories based on an institutional approach [Electronic resource]. Management of economic systems: electron. scientific journal 2014, №9 - p.69. Mode of access: <http://www.uecs.ru/predprinematelstvo/item/3051-2014-09-25-06-57-54>.
4. Sinyaeva, I. M. Marketing in small business [Text]: textbook. manual for universities / I. sinyaeva, S. V. Zemlyak, V. V. Sinyaev. - Moscow: Unitidana, 2006. - 234 p.
5. Soluttseva, S. N., Chentsova, A. S. Determination of a possible break in the established equilibrium and the type of bifurcation in the system of agglomeration process in the regional economy [Text]: article / S. N. Soluttseva, A. S. Chentsova // Young scientist. 2013. №9. – p.58
6. Turar, A. Development of transport and transit potential-a powerful resource of the economy of Kazakhstan [Electronic resource]. – BNEWS.kz. 2014. - access Mode: <http://bnews.kz/ru/news/post/240474>. - Blank from the screen.
7. Gorbunov, and Transport communications as an object of research in political science. Changes in the political world [Text]: article / Gorbunov A. // Power. 2008. №9 – p.124.
8. Ulyanova, O. Yu., Polyakov, V. G. Macroeconomic impact on the development of regional infrastructure as the basis for economic growth of the territory and industry [Text]: article / O. Yu. Ulyanova, V. G. Polyakov // Russian business. 2008. №11. Issue 1 – p. 122.
9. Mottaeva A. B., Mottaeva A. B. the Role of transport infrastructure in the spatial integration of the regional economy // science of Science. 2014. Vol. 3.
10. Korolev, A. New silk road [Text]: article / A. Korolev // liter. 2014. July 29. - p. 8.