

Multihub – point of increase in Samara agglomeration-conurbation spatial development

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Abstract. The article deals with the theoretical position of the newly created environment for the functioning of transport and logistic services. The main purpose is to research the formation and functioning of multimodal transport and logistic hubs (Multihub). There were considered the practical issues connected with the realization of big investment projects of logistic infrastructure development that are inclined to local and international transport corridor. There are suggested the possible ways to place Multihubs in promising «points of increase» which are planned to be at the contact points of the peripheral Samara agglomeration-conurbation suburban belt with local rural settlement systems in order to include the Samara gubernia in the structure of the currently planned international transport corridors Europe - America and the Arctic – Southwestern Asia. The author of this article was tasked to explain the principles of phased development for the near, medium and long-term perspective of Volga region transport and communication framework. Currently, there are strong centripetal trends of movement from rural settlement systems to subcentres of Samara agglomeration. The developed approach contributes to the development of a multipolar multifunctional region structure. It will regulate the multidimensional field of social and functional spatial processes will provide conditions to increase the consumer and investment territory attractiveness that provide the effective use of land and socialization of the urban community.

1. Introduction

Nowadays megalopolis demands more and more new requests to transport hubs and complexes of station buildings and structures associated with the transshipment and storage of goods. The current period of urban development in Russia is connected with the search activity and assessment of the resource potential of territorial complexes that meets the concept of sustainable development, proclaimed at the historical summit “Planet Earth” in 1992 in Rio de Janeiro dedicated to the development of megapolis.

The first railway communications appeared in the 1830s due to the need of communication between cities. In 1837 there was built the railway St. Petersburg-Tsarskoye Selo (Pushkin) with a length of 27 km. It connected the capital of Russia with the Royal residence. At the same time, the science about the railway was developing [1]. Academician N. P. Petrov made a great contribution to a calculation of the railway track strength. Railways help to increase the export of Russian grain, reducing the economic cost for its transportation, making it more competitive among other categories of goods, but we can not underestimate the importance of transportation of fuel cargoes, construction materials, ore, industrial goods, food necessary for the country's regions normal economic life and



meet the daily needs of the population. Samara-Zlatoust railway was one of the biggest railways in Russia of the late XIX – the first third of the XX century. This railway linked the Volga region and South Urals and connected Russia and Europe with Ural, Siberia and Far East [2]. The Russia state history and its boundary formation are connected with exploration of Russian North and development of transport routes on this territory. The North of Western Siberia has always played a significant economic and political role for Russia. The most important of the Railways of Eurasia – the Great Siberian way, connecting Moscow with the largest East Siberian and far Eastern industrial cities of Russia. This railway became an addition to the Northern sea route. Transport arteries passing through the Suez or Panama canals can become a good alternative. The distance traveled by ships from the port of Murmansk (Russia) to the port of Yokohama (Japan) through the Suez Canal is 12,840 nautical miles, the Northern sea route – only 5,770 nautical miles [3].

Today, the governments of the world's leading countries are investing powerful resources in new transportation technologies and transport monitoring systems to provide the maximum amount of residents' pedestrian access to transport hubs. The mission of the Russian transport strategy is to create conditions for economic growth, increase the competitiveness of the national economy and the quality of the people's life through access to safe and quality transport services, turning the geographical features of Russia into its competitive advantages [4]. The construction of transport infrastructure directly affects the investment attractiveness of the territories: the inflow of investments into urban areas increases significantly. The revealed qualities make it possible to assert the unicity of the Multihub, unadmitted in urban planning design at all levels of the morphological structure. The most important task in this regard is the translation of the results of historical and theoretical research into practical urban planning, including domestic.

2. Samara agglomeration- conurbation

The Samara urbanization model includes a compact concentrate of settlements, mainly urban ones, united in a complex multicomponent dynamic system with intensive production, transport and cultural ties. The agglomeration effect generated by the proximity of settlements located throughout 220 km of the Volga bend of Luke causes economic and social benefits by reducing the cost of industries and other economic objects in the Samara agglomeration (Samara, Kinel, Syzran, Togliatti) [5].

Since the 1960s, there has been researching the Samara agglomeration, with the involvement of foreign scientists and urban planners. In the 1990s, in the scientific community there were considered several scientific strategies of the agglomeration spatial development: the formation of a forest-park safety belt, nearby and distant satellite towns, the “five fingers” - the radial beam development of the agglomeration around Samarskaya Luka, linear conurbation [6].

The Samara agglomeration is the third in Russia with its population 2.3- 2.7 million (depends on the variants of boundary determination). It is polycentric in the form of spatial organization [7].

The volume of gross regional product (GRP) is a general indicator that characterizes the socio-economic development of the region. Samara region takes 10th place among the subjects of Russia (without autonomous districts) and in the total volume GRP Samara has 1,8%. In the sectoral structure of the Samara region the largest percentage is in manufacturing (22.4%, as estimated in 2017), mining (16.3%), real estate operations, rental and provision of services (13.7%), trade (11.4%), transport and communications (9.5%), agriculture (5.2%) and construction (4.8%) [8].

2.1. Brief overview of the prior development of resettlement

The city-planning history of the Samara province is 433 years. In the second part of the XVI century, the territory of the Samara Volga region was one of the centers where the Russian Cossacks formed. In addition to political and economic factors, natural conditions contributed to this – the Samara Region with its dense forests and mountains, secluded floodplain Islands, the Volga trade route. Until the mid-80s on the territory of the Samara region there were no fortresses, towns, or permanent garrisons. The idea of building Russian fortress cities on the great Volga route between Kazan and Astrakhan

appeared after the region joined the Russian state, when the Volga became the main trade artery of the country. This path needed to be secured [9].

In 1586, Samara was founded by Tsar Fyodor I Ivanovich decree as a fortress for shipping protection where the river flows near the city, and to protect borders.

At the end of XVI – the beginning of XVII centuries in the territory of Samara Luke the agricultural and trade area with the settled permanent population began to develop.

After the fall of serfdom, the socio-economic development of the region accelerated. The growth of trade and industry was connected with the construction of Railways and the development of the Volga river transport, the transformation of Samara into a major transport hub, linking the center of the country with Siberia and Central Asia [10].

On December 6, 1850, Emperor Nicholas I issued a Decree to the Senate on the foundation of the Samara province in January 1, 1851, the center of which was Samara with a population of 20 thousand people. The new province consisted of seven counties: Samara, Stavropol, Bugulminsky, Buguruslansky, Buzuluksky, Nikolaevsky and Novouzensky. There were 529 1 343 people of both sexes. There were 2,022 settlements, 8 of which were cities. Proceeding from the statistic in 1856, the urban population was 3.19%, rural-96.81%. By 1917, 90 industrial enterprises, a mechanical bakery, and an elevator with a capacity of 58 thousand tons of grain have been already operating in Samara. The population of Samara has reached 150 thousand people [11].

At present, after the transition from the post-industrial stage to the information technology society, scientific developments become the main driving force of the economy - the base of the knowledge industry.

Around the Zhigulevskaya bend, has formed a stable triangle of cities performing transit and serving functions of the surrounding territories. Samara Luka is the main hub of the communication framework. The role of modern Volga cities, as hubs of meridional and latitudinal directions, in the settlement framework has increased significantly. The Volga River as the axis of the urban planning resettlement framework created the largest cluster of cities in the world, with a population of over 100 thousand inhabitants. Here are the cities (Ulyanovsk, Samara, Volgograd) at the confluence of large inflows. All Russian movements across the Volga are something like the development of the “Mongolosphere” (in the terminology of Lev Gumilyov) [12].

Today we are considering ways for the revival of the Great Silk Road. The Caspian Sea region is the largest oil pipeline of the existing systems for transporting a traditional energy source - oil, with a length of 1380 km, a capacity of 30 million tons per year, which passes across Russia through the Samara province. In 1900, the first oil tanker in the world was built in the Caspian [13].

3. Theoretical research model

The theoretical model is the formation of a large transport hub with the creation of a dry port and multimodal terminals based on a linear corridor and an interconnected system of objects of automobile, railway, air and water transport, as well as related infrastructure.

Multimodal transport and logistics hubs or a Multihub is a site at the intersection of trunk routes, consisting of complexes of buildings and structures, where the activities of all types of transport and participants in the delivery of inventory flows are coordinated.

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The purpose a Multihub forming:

- reduction of the number of participants in the supply chain;
- reduction of the product cost for end consumer;
- fast delivery of material flows;
- placement of multi-functional facilities on its sites;
- attraction of domestic and foreign investments for the development of transport infrastructure and etc.

The fundamental elements of the Multihub infrastructure are international transport corridors that concentrate cargo flows and enterprise concentration centers in their directions.

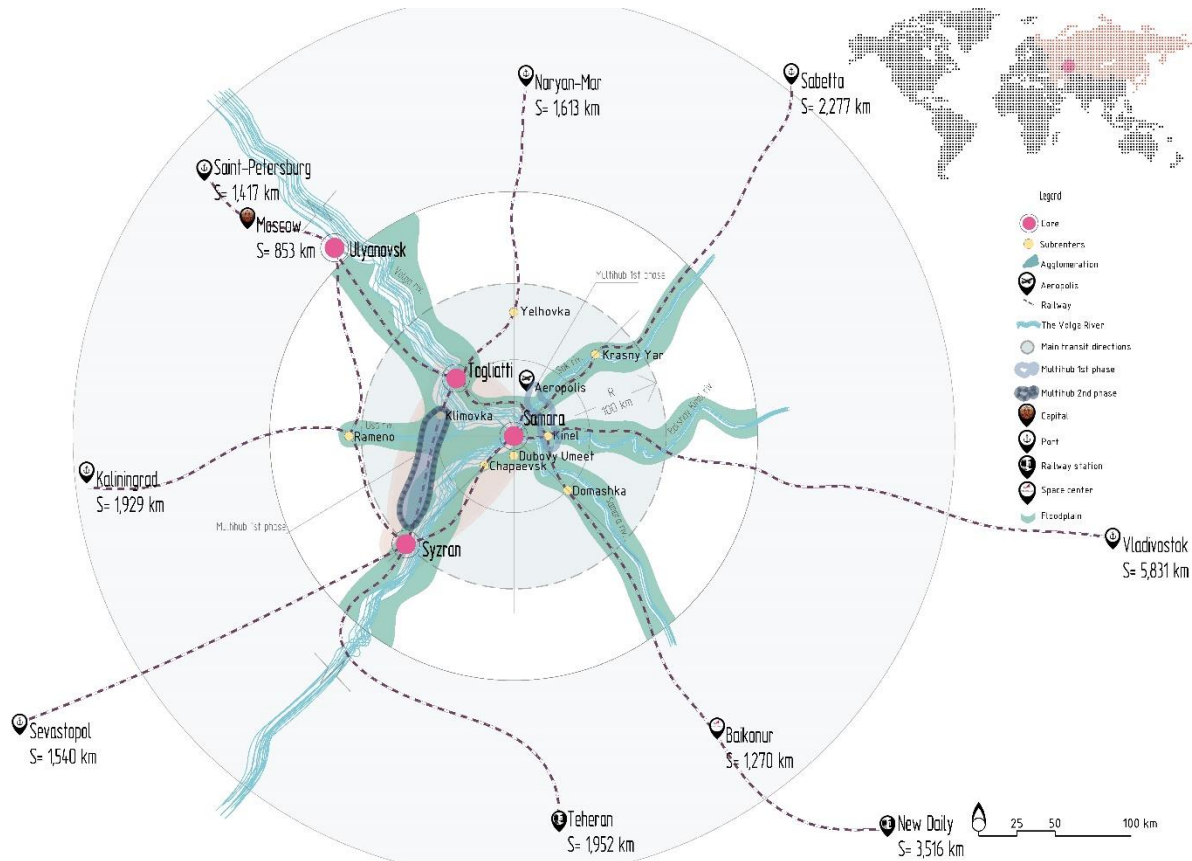


Figure 1. Theoretical model of the phased development of the Samara agglomeration

It is proposed to create several multihubs on the Samara bypass in the area of Kinel, which is a major transport hub and it allocates the flow to the east to the Vladivostok port and southeast to the contact points: Baikonur Cosmodrome and large industrial cities of India. Another multihub is proposed to be created in the area of Syzran, which is a large transport hub and allocates the flow to Western Europe to the Kaliningrad port with a view to Germany, Austria and Switzerland. Southwest: along the Volga with access to the Black Sea port of Sevastopol and south: along the Greater Caucasus Range to Iran. The principles of the phased development of Samara at the level of the outskirts, agglomeration, province, and Volga region are divided into the short, medium and long term (Figure 1).

3.1. The near-term prospect – until the 2030-s

Development of a transport infrastructure network, including the creation of a high-speed rail network. The short-term prospect will be the development of contact points, where Samara is the center to:

Southwest: Chapaevsk - Syzran - Balakovo - Saratov - Kamyshin - Volgograd - Krasnodar - Sevastopol (port);

West: Chapaevsk - Syzran - Penza - Ryazan - Moscow - Smolensk - Minsk (Belarus) - **Kaliningrad (port)**;

Northwest: Tolyatti - Klimovka - Terenga - Ulyanovsk - Sergach - Nizhny Novgorod - Vologda - **St. Petersburg (port)**.

3.2. Medium-term - until the 2050-s

The prospect of further development of the high-speed transport network will be development at contact points, where Samara is the center to:

Northeast: Krasny Yar - Sergievsk - Klyavino - Bugulma - Ufa - Yekaterinburg - Tyumen - Tobolsk - Khanty-Mansiysk - Salekhard - **Sabetta (port)**;

East: Kinel - Buguruslan - Ufa - Yekaterinburg - Tyumen - Tomsk - Krasnoyarsk - Severobaykalsk - Novaya Chara - Tynda - Blagoveshchensk - Khabarovsk - **Vladivostok (port)**;

Southeast: Kinel - Buzuluk - Orenburg - Sol-Iletsk - Aktobe (Kazakhstan) - Baikonur (cosmodrome) - Tashkent (Uzbekistan) - Islamabad (Pakistan) - **New Delhi (India)**;

South: Syzran - Saratov - Volgograd - Astrakhan - Derbent - Baku (Azerbaijan) - **Tehran (Iran)**;

North: Togliatti - Elkhovka - Dimitrovgrad - Naberezhnye Chelny - Izhevsk - Kirov - Syktyvkar - Ukhta - **Naryan - Mar (port)**.

3.3. A long-term prospect – 2060-s

In the long term, there are possible other "utopian" strategies: connection to global transport corridors (The New Silk Road); introduction of innovative kinds of transport and automating control based on artificial mind. Modernization of the transport network will be a ring road around the provincial centers, created on a geographical basis.

4. Conclusion

The relation development create intersections between them, the formation of stable hubs of the forming framework of urban areas. Communication gave rise to the city. The cities serve these links through the development of handicrafts, trade, industries, educational and managerial functions.

1. Cities are hubs of products exchange obtained from resource-producing territories;
2. Creation of high-tech international transport corridors (Arctic-Central Asia and Europe-North America), will expand Intercontinental links and bring cities closer to each other. The situation on the territory of the Samara region is determined as meridional and latitudinal external relations of national and international rank;
3. The creation of a Multihub in the areas of good and service cooperation will create a highly urbanized zone that will significantly improve the transit potential of Russia;
4. Infrastructure development with the priority of settlement formation in the Eastern, South-Eastern and Southern directions with new volumes of housing and cultural and social construction, new production to create new jobs;
5. Expansion of the products range and reorientation of outlet market;
6. The Samara province economy structure is rather diversified. The specialization spheres of Samara are aerospace, automotive, chemistry, material production, non-ferrous metallurgy, primary oil refining and production of synthetic rubbers. This is a very significant compound of the country's industrial potential.

Transport infrastructure not only fixes the planning structure of the city, but also largely determines its subsequent development. Elements of the transport infrastructure are fixed in space rigidly, and the higher this rigidity the higher the class of communication.

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