

URBAN TRANSFORMATION OF A POST-SOVIET COASTAL CITY: THE CASE OF SAINT PETERSBURG

ABSTRACT. At the turn of the XX-XXI centuries, post-socialist cities of Europe experienced an active transformation of their socio-demographic and economic structure. A striking feature of post-Soviet cities was the preservation of the disproportionate weight of industry in the economy against the background of a long absence of the real estate market. This phenomenon highlighted the need to solve the problems of socio-economic inequality within the city and restructuring its economy. This is especially true for Russian cities experiencing the shifts in the territorial structure of the population under the influence of transition to market economy, the third industrial revolution and the change of economic- geographical location. This study focuses on identifying trends in the social segmentation of the urban space of St. Petersburg as the second largest city in Russia and a socio-economic center of national importance. The social stratification of the city was studied at the grassroots administrative and territorial level based on the assessment of spatial distribution and the formation of territorial groups of the population with certain qualitative characteristics. The object of the study was 111 municipalities of St. Petersburg. The dynamics of their five most important indicators of demographic, social and economic development in 1989–2018 was analyzed: real estate tax on individuals per capita; the proportion of entrepreneurs; own incomes of municipalities per inhabitant; the proportion of people with an academic degree; cost of housing. Using the rank method, a social welfare rating was compiled. Information for the study was taken from the materials of the general urban planes of St. Petersburg in 1966, 1987 and 2005, the All-Russian population censuses of 2002 and 2010, the databases of the Federal State Statistics Service and the Federal Tax Service, and from the real estate «CIAN» company. The increasing social segregation by income was revealed. The existing differentiation of municipalities in terms of welfare is shown. The poorest are the municipalities of the southern part of the city (Kolpinsky, Nevsky, Krasnoselsky districts and Kronshtadt), while the most prosperous are the municipalities of Petrograd and Central districts, as well as certain territories of the municipal district of Moskovskaya Zastava, the villages of Komarovo, Repino and Solnechnoe.

KEY WORDS: coastal agglomeration, urban zoning, population structure, resettlement determinants, city, St. Petersburg

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INTRODUCTION

The post-socialist cities of Europe, including the largest cities of Russia, are a special phenomenon for research. Traditionally they differ from western cities in terms of their spatial features, morphology and social character, demonstrate a lower level of social segregation and marginalization, while also offering safer living environments (Hirt 2012). In 2007, Kirill Stanilov (2007) noted that these cities can develop as part of one of four types of urbanization: Western European, North American, East Asian, or the type typical of third world countries. According to him, the post-socialist cities combine some features of all four types of urbanization. In the 1990-2000s, business activity increased in the central districts of the cities under consideration, which is typical of the Western European type, and at the same time, there is uncontrolled growth of suburbanization and the all-encompassing nature of privatization processes in the urban economy, which is typical for the North American type. Over the past 20 years, several major studies have been published devoted to certain aspects of the transformation of the social, the demographic and economic structure of the population of post-socialist cities in Europe (Berki 2014; Szafranska 2015, 2019; Hirt 2012; Keivani et al. 2001; Kemper 1998; Kotus 2006;

Musterd et al. 2017; Ouředníček 2009; Sailer-Fliege 1999; Stanilov 2007).

Transformation of the socio-demographic and economic structure of the post-socialist cities of Russia is defined by two main factors – the abandonment of the planned economy in favor of a market economy model and the transition to the third industrial revolution in the context of building up a new information economy. The former brought about changes in the social and economic structure of the population, the structure of employment and property in the city, and the latter – transformed all aspects of the life of the urban community from production and residential areas to employment and leisure.

Transformation of the territorial structure of cities, change of economic functions of urban space, social stratification and segregation, gentrification and suburbanization in the United States and Western Europe have been actively studied since the mid-1980s. (Humphery and Skvirskaja 2012; Kenneth 1985; Pacione 2005; Smith 1996). Today, special attention is paid to the issues of socioeconomic inequality in large agglomerations, including post-socialist cities of Europe, due to the growing concerns for social stability (Fedorov et al. 2018; Musterd et al., 2017). Studies suggest that socio-economic segregation has intensified, which is determined

by social inequality, problems of globalization and economic restructuring, and the transformation of social and housing opportunities. Post-socialist cities of the former USSR are a particularly interesting subject for research in this sense. The territorial structure and the development pattern of these cities differ markedly from the cities of Western Europe and North America, which is due to a long period of absence of the real estate market (Bertaud 2013). Until the early 1990s, disproportionate weight of the industrial component in the urban economy remained in a number of cities, which has led to difficulties in the transition to a market economy model and the third industrial revolution (Ruble 1990).

In the 1990–2000s, several key studies were published that revealed the features of agglomeration, suburbanization and differentiation of the urban space of Moscow (Borodina 2017; Brade et al. 2013; Kirillov et al. 2009; Kurichev et al. 2018; Mahrova 2014, 2015; Mahrova et al. 2012; Mahrova et al. 2015; Pavljuk 2015). For instance, the study conducted by Mahrova and Kirillov (2015) concludes that the post-Soviet Russia developed a new model of urbanization, where the housing sector became an important indicator and factor of development. During this period, St. Petersburg also attracted the attention of researchers, although to a lesser extent. In particular, we will mention the study by Aksenov et al. (2006) on the transformation of the city's urban space in 1989–2002. Some scholars focused on the development of industry and tertiary sector in St. Petersburg addressing their impact on the urban environment (Aksenov et al. 2001, 2016, 2018; Bater 1980; Bater et al. 2000). They demonstrated that the transformations that took place in the post-Soviet period influenced not only the architecture and topography of St. Petersburg but also the socio-geographical makeup of the population, by means of – among everything else – altering the placement parameters of various social groups. In fact, uncontrollable de-industrialization and economic primitivization of the urban economy developed primarily against the background of the transformations of 1990–2000s mentioned above. Zubarevich (2017) emphasizes that in the 1990s, St. Petersburg lagged far behind the national capital in terms of population income. Convergence occurred only in the first half of the 2000s when St. Petersburg received target support from the federal authorities. As for the socio-demographic and spatial structure of the city and its agglomeration, we can recall a number of dedicated studies (Bugaev 2015; Degusarova et al. 2018; Reznikov 2017; Hodachek 2017; Krykova 2016), including those held by the authors of this article (Anokhin et al. 2017; Zhitin 2015). These studies analyze the change in population during the inter-census period, as well as the transformation of the social structure of the population.

This article sets itself the task to fill the existing gap in the complex socio-geographical studies devoted to the transformation of the socio-demographic and economic structure of the population of cities at the turn of the 21st century using an example of the St. Petersburg – the second largest city of Russia. The aim of the study is to identify the trends in the social segmentation of urban space. Particular attention is paid to the spatial divergence of the demographic development of the metropolis in the context of the post-socialist transition, which caused the growth of social inequality.

MATERIALS AND METHODS

Social inequality is an integral feature of the development of human society. The differences that exist in the employment,

the level of income and consumption, the availability of spiritual and material goods of decent quality most fully and objectively characterize a society. With that the most important aspect of studying the social stratification of society is its spatial distribution, the formation of territorial groups of the population with certain qualitative characteristics. There are quite a few indicators of social stratification, all of which can be combined into several groups, reflecting the level income, education, professional occupation, compliance with certain standards of behavior. The last of the listed groups of indicators is typical for individual ethno-confessional and sociocultural communities and is most difficult to quantify. In the post-industrial society, there is no voluntary segregation on a professional basis – cohabitation within the framework of guild corporations was typical for the cities of the Middle Ages, but not for the cities of modernity.

Population income and education are most accessible and convenient indicators for studying social stratification of the urban population. Unfortunately, not all data reflecting population income and, as a result, their level of welfare, is available for analysis. In the framework of the 2010 all-Russian population census, there was no question asked about the volume of citizens' income. This information is also missing in the Municipal Education Indicators Database of the Russian Federation, published by Rosstat annually since 2006. The studies of the standard of living and population income conducted by Rosstat do not allow comparing these indicators at the local level (by municipal units of the constituent entities of the Russian Federation) due to the limited sample used.

Therefore, among the indicators of transformation of the socio-demographic and economic structure of the population of St. Petersburg available for analysis at the lower administrative-territorial level of municipalities and districts, five key demographic, social and economic indicators are selected, data on which can be obtained for all or most of the 111 municipalities:

Real estate tax of individuals, per capita.

The first indicator enables comparison of the average value of the real estate (housing, garage, non-residential premises) owned by citizens in the territory of the municipality. As a rule, this refers to residential houses, the main financial asset for the majority of Russians. The average value of the property tax paid per resident of a municipality allows one to determine the level of welfare of the population of a territory.

Proportion of individual entrepreneurs to total employed population.

The share of employers¹ in the total employed population in the economy makes it possible to make inferences about the distribution of a higher income level at a given point in time. It is, of course, possible for an employee of a company to have a bigger income than that of an entrepreneur, since a top manager of a large company will earn more than a self-employed individual, yet in the total aggregate of categories «employee» and «employer» the income level is higher for the latter.

Own income of municipalities, per capita.

In St. Petersburg, municipal budgets make up only about 2% of the consolidated city budget, and due to the limited powers of local governments have little effect on the socio-economic situation of their residents. However, the improvement of the territory is the prerogative of local authorities and the responsibility of municipalities. Thus,

¹ In the 2010 census form, this category is described as "self-employed (in their own enterprise or organization, in their own business) with the involvement of employees".

the size of budget revenue of municipalities is one of key indicators of the social well-being of a particular territory selected for the comparative analysis.

Proportion of scientific degree holders to total population.

Today, when higher education is becoming truly widespread, the number of college or university graduates can no longer be considered an important indicator of social stratification of society. Thus, in addition to the previously noted territorial distribution of the population with higher education, the concentration of persons with scientific degrees is considered¹ as an indication of a certain social status. The mere presence of a degree does not indicate that its holder belongs to an «elite group», but a higher proportion of citizens who have completed postgraduate education can be considered as an indicator of the social well-being of a particular residential area. Quality characteristics of urban environment are predominantly shaped by the people living in a territory. Like other information on the level of education, information on the number of scientific degree holders is collected in the Russian Federation only during population censuses.

Cost of real estate.

For most of the population, private accommodation has become the main financial asset and indicator of living standards. Therefore, market value of real estate was chosen as an important indicator of the social stratification of society. In the Soviet period, the division of «rich» and «poor» areas in Leningrad was rather conditional, although even then many city districts differed in the level of comfort and, accordingly, social composition of the population. The so-called «Stalinkas» – houses with improved layout built in the 1930-50s – had a much higher consumer value than «Khrushchevkas» and «Brezhnevkas» built in the 60-70s. In the 1990s, with the transition to market relations, territorial division of urban societies began to acquire the character of differentiation, primarily in terms of income.

The dynamics of indicators selected was analyzed for the period from 1989 to 2018. Territorial shifts in the distribution and structure of the population of St. Petersburg and its immediate suburbs were estimated broken down by the administrative-

territorial level of municipal districts. A comparison of the five indicators made it possible to rank the municipalities of St. Petersburg in terms of social well-being. To do this, we ranked the municipalities for each of the indicators in descending order of value. For four indicators (real estate tax; share of individual entrepreneurs; own incomes of municipalities per capita; share of persons with scientific degrees), the rank value varied from 1 to 111, for one (real estate cost) – from 1 to 99, as for 12 municipalities of St. Petersburg data on the commercial value of one square meter of housing was not available. The ranks acquired were summed up and then the average rank value was calculated². The minimum value of the obtained indicator (i.e. the average rank of social well-being – ARSW) is inherent in the most socially prosperous municipalities of the city. Conversely, the maximum value of the average value of the rank is typical for areas with the lowest standard of living. In theory, the ARSW of the municipalities of St. Petersburg can vary from 1 to 111.

The study relied on the materials of the master plans of St. Petersburg in 1966, 1987 and 2005, the data of the all-Russian population census of 2002 and 2010, the database of the Federal State Statistics Service, the database of the Federal Tax Service, as well as the largest real estate database in Russia and St. Petersburg, CIAN.

RESULTS AND DISCUSSION

Territorial changes in the settlement of the population of St. Petersburg

By the end of the Soviet period, the spatial structure of the city was composed of several large isolated residential areas. The central part of the city shaped by the end of the 19th century was surrounded by a belt of industrial enterprises and storage areas cut by transport corridors in the southern (Peterhof and Tsarskoye Selo (Moscow) avenues, Baltic, Warsaw, Tsarskoye Selo (Vitebsk) and Moscow railways) and the northern (Finnish railway) directions. By the end of the Soviet period, the spatial structure of St. Petersburg was set as a collection of 10-12 semi-isolated residential areas separated by wide strips of non-residential areas – industrial zones, radial transport corridors, green spaces (Fig. 1).

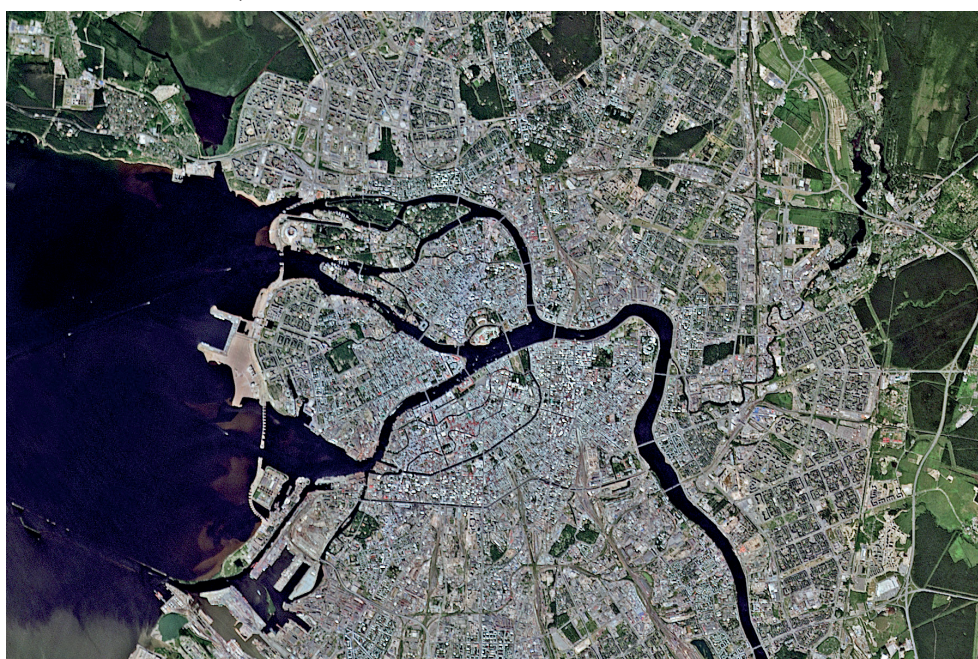


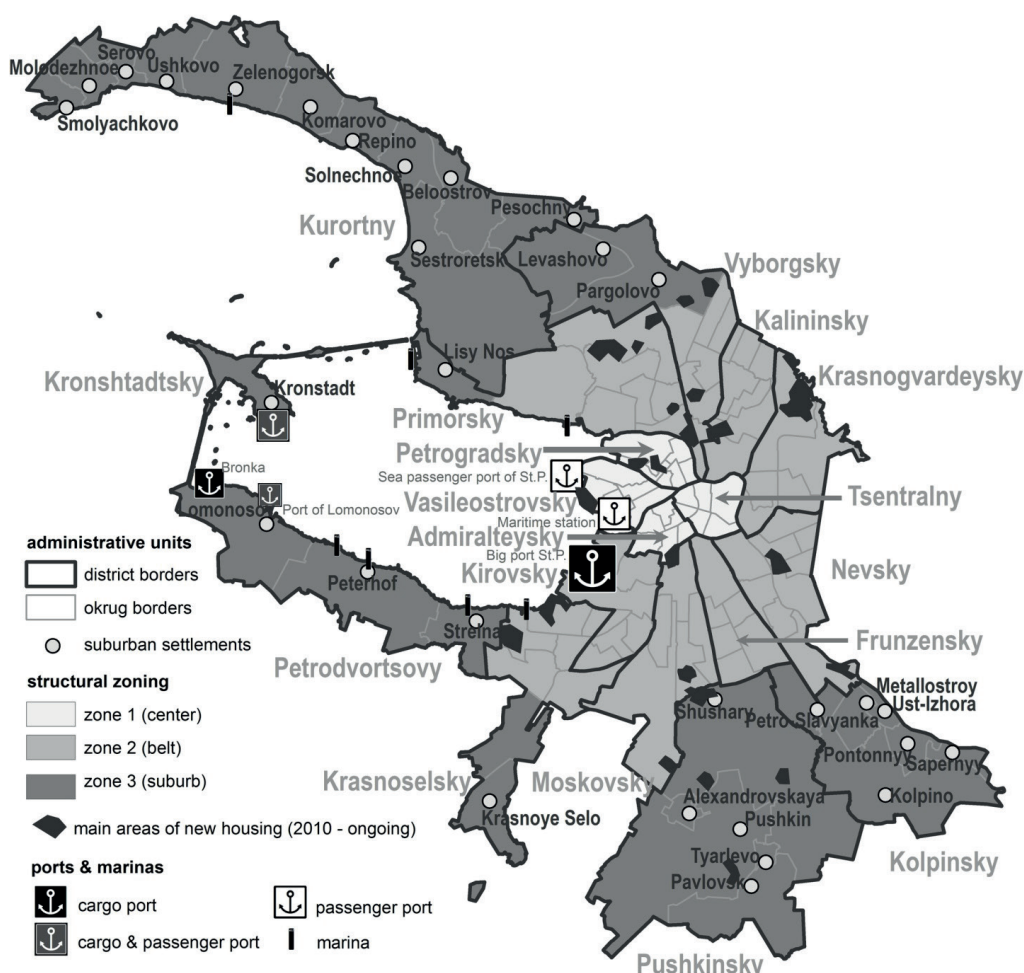
Fig. 1. View of St. Petersburg from space

¹ Russian postgraduate degrees of candidate of science and doctor of science (habilitation).

² For 99 municipalities of St. Petersburg, the sum of the ranks is divided into five, and for 12 municipalities – by four.

The master plan of 1966 for the development of Leningrad was dedicated to solving the housing problem and was perhaps the most successful in accomplishing this objective. The next master plan was adopted in 1987 and extended not only to Leningrad, but also to the Leningrad region, with the city and the surrounding region being considered as a single territory. It was planned to transfer part of the industrial production from the city to the region, securing a significant area of city land for housing. However, in the early 1990s, St. Petersburg, like the rest of the country, plunged into a deep crisis caused by the transformation of the political and socio-economic system, and most of the activities outlined in the master plan of 1987 were not implemented. The latest Master Plan for the Development of St. Petersburg was adopted in 2005. Unfortunately, in the new economic conditions, the possibility of pursuing a unified town-planning policy turned out to be quite difficult since it is necessary to take into account the interests of a large number of stakeholders. Over the past years, numerous changes have been repeatedly made to the master plan, distorting the original idea.

The St. Petersburg megalopolis, including the suburban areas (administratively included in St. Petersburg (Leningrad) since the late 1980s) and the areas of the Leningrad region adjacent to the city line is characterized by a high degree of unevenness in the placement of the population. The central part of the city that occupied less than 5% of its area in 1989¹ had almost 20% of total inhabitants. The population density in Vasileostrovsky, Admiralteysky and Central regions² was 14–19 thousand people per sq.km. This compact territory was surrounded by a belt of residential areas (Ozerki, Commandantsky, Grazhdanka, Rzhnevka, Porokhovye, Kupchino, Rybatskoye, Sosnovaya Polyana, etc.), which emerged in the 1970s–80s. By the end of the Soviet era, 69% of the city's population lived in these areas³. The third belt of residential areas of St. Petersburg (Leningrad) consisted of suburban villages⁴ and towns⁵, administratively included in the borders of the «northern capital». Occupying more than 63% of St. Petersburg's area and only 11.5% of its population, the eastern and northeastern direction of the suburban belt extends beyond the administrative boundaries of the city and extends over part of Vsevolozhsk district of the Leningrad region (Fig. 2).



Coastal districts: 1. Kronshtadtsky – 19.53 sq.km; 2. Kurortny – 268.19 sq.km (marina Zelenogorsk); 3. Primorsky – 109.9 sq.km (marina of Lakhta Center, marina of Lisy Nos); 4. Petrogradsky – 19.54 sq.km; 5. Vasileostrovsky – 16.7 sq.km (Maritime station, Sea Passenger Port); 6. Kirovsky – 47.46 sq.km (Big port of St. Petersburg); 7. Krasnoselsky – 90.49 sq.km (marina Baltiets); 8. Petrodvortsovy – 107.08 sq.km (Bronka port, Port of Lomonosov, Peterhof and Strelina marinas).

Fig. 2. Administrative and structural division of St. Petersburg

¹ In the administrative boundaries of Leningrad – St. Petersburg.

² Until 1994, there were two administrative districts (Leninsky and Oktyabrsky) in the territory of the Admiralteysky district, and three (Dzerzhinsky, Kuibyshevsky and Smolinsky) administrative districts in the Central district.

³ Primorsky, Vyborgsky, Kalininsky, Krasnogvardeysky, Nevsky, Frunzensky, Moskovsky, Kirovsky, Krasnoselsky districts of St. Petersburg.

⁴ Ushkovo, Serovo, Molodezhnoye, Smolyachkovo, Repino, Komarovo, Solnechnoye, Lisy Nos, Pesochnoye, Pargolovo, Metallostroy, Ust-Izhora, Pontonny, Saperny, Tyarlevo, Aleksandrovskaya, Shushary, Strelina.

⁵ Zelenogorsk, Sestroretsk, Kolpino, Pushkin, Pavlovsk, Krasnoye Selo, Petrodvorets (Peterhof), Lomonosov (Oranienbaum), Kronstadt.

Over the following three decades (1989–2018) there was a significant redistribution of the population between these three zones of St. Petersburg. The resettlement of the overcrowded housing of the central part of the city led to the fact that today only 13% of its inhabitants live here. Thus, the population of the former Dzerzhinsky, Smolninsky and Oktyabrsky districts has declined over thirty years by a quarter, the former Leninsky district – by a third, the former Kuybyshevsky – by more than 2 times.

The number of residents of the Petrograd side – one of the most prestigious areas of the city, has decreased by a quarter. Because of the renovation, the «gray zones» of industrial territories is gradually disappearing, separating the historical center from the mass housing areas of the Soviet period. The territory of residential areas of the city have grown due to newly developed ones (Yuntolovo, Bogatyrsky, Kollomyagi – in the north-west, Baltiyskaya zhemchuzhina – in the south-west), as well as «spot buildings» in the existing microdistricts. As a result, the proportion of St. Petersburg residents living in the second zone increased to 71% of the city's population. In the third zone – the suburban area, changes in the population distribution were multidirectional. In some suburban villages and towns, the population has declined quite significantly. For 1989–2018, the population in a number of settlements in the Kurortny district (Ushkovo, Molodezhnoye, Smolyachkovo, Repino) and in the city of Pavlovsk (Pushkinsky district) decreased by 30–40%, in the villages of Komarovo (Kurortny district) and Pontonny (Kolpinsky district) by 16–17%. In others (the city of Kolpino, the city of Kronstadt, the city of Lomonosov, the settlement of Petro-Slavyanka, Solnechnoye, Aleksandrovskaya), the population practically did not change. In general, the proportion of the suburban area over thirty years saw a 1.4 times increase and in 2019 amounted to 15.7% of the total population of St. Petersburg.

Unfortunately, a relatively detailed analysis of the territorial changes in the distribution of the population of St. Petersburg is only possible for the period from the beginning of this century, after the municipal reform in the Russian Federation. Until this time, data on the population of St. Petersburg is only available in the context of 41 urban areas and individual villages. From 2002 on, statistics is available about the population of 111 intra-city municipalities of St. Petersburg¹. At the same time, the size of the territory and the population of the municipalities of the city varies greatly. Thus, the population of the smallest of the municipality Serovo village (Kurortny district) is only 277 people, and the most populated – the municipal district Kolpino city (Kolpinsky district) – almost 148,000 inhabitants. The area of St. Petersburg municipalities can vary by tens of times (from 0.3 to more than 100 sq. km).

Since 2003, after 12 years of depopulation, the trend of population growth in St. Petersburg has been recovering. As seen in fig. 3, there is a center-peripheral effect in the dynamics of the number of residents of municipalities of the city over the past 16 years. A 15–35% population decline is registered in most of the Admiralteisky and Centralny districts. On the other hand, there has been more than 1.5 increase in the number of residents in the northern (Pargolovo, Yuntolovo, Kolomyagi, Lakhta) and southern (Shushary, Aleksandrovskaya, Zvezdnoye, Gorelovo) municipalities.

During this period, the St. Petersburg agglomeration has finally gone beyond the administrative boundaries of the «northern capital» proper and now includes rural and urban municipalities of several districts of the Leningrad region (Fig. 4).

Thus, over the past thirty years, there has been a redistribution of the population from the central and more established residential districts of St. Petersburg to the outskirts of the city and even beyond its administrative boundaries. The attractiveness of the «northern capital» for migrants from other regions of Russia and from abroad increases the demand for housing. To date, St. Petersburg has

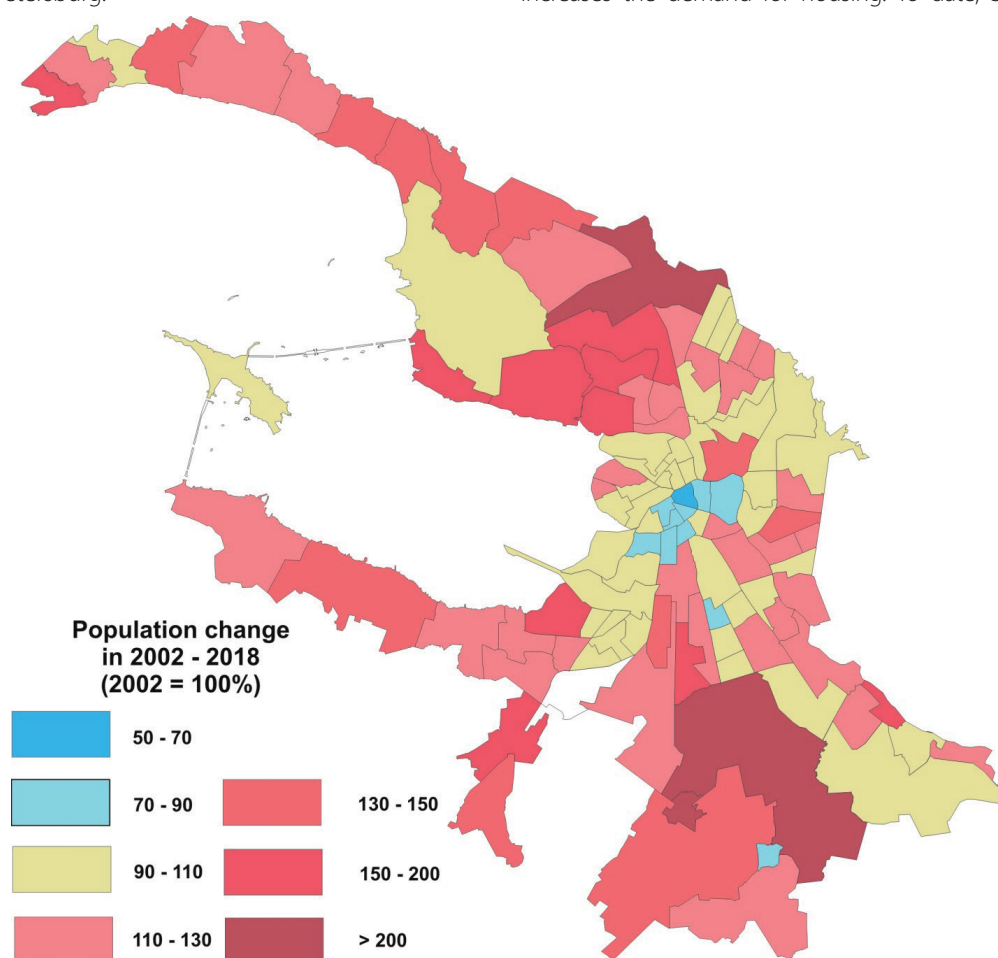


Fig. 3. Population dynamics by municipalities of St. Petersburg in 2002–2018

¹ 81 municipal districts, 9 cities and 21 villages.

almost completely exhausted the possibilities of new housing construction in existing residential areas. Redevelopment of industrial areas, which has been actively pursued in St. Petersburg in recent years, can only partly address the shortage of land plots for housing development. Therefore, the city is expanding rapidly, de facto including in its composition the territory of the adjacent areas of the Leningrad region. In this regard, preservation and strengthening of the internal transport connectivity of the territory of the megalopolis will become the most acute task of the spatial development of St. Petersburg in the coming years.

«Rich» and «poor» districts of St. Petersburg: the beginning of segregation?

Considering such a large city as St. Petersburg, it is necessary to pay attention not only to the spatial differences of the demographic changes taking place but also to the social and economic heterogeneity of its territory. Let us consider the distribution of these indicators in the territory of St. Petersburg.

Real estate tax of individuals, per capita

According to the data for 2016, the average annual property tax was 434 rubles per capita. Among the municipalities, this indicator varied in almost 20-fold range from 50 rubles per capita in one of the most crowded and remote municipalities – Smolyachkovo village (Kurortny District) – to almost 2,000 rubles in Chkalovskoe municipality located in the center of the city (Petrogradsky district). However, it would be too simplistic to assume that the cost of real estate per one St. Petersburg resident depends only on the distance to the center.

Indeed, the amount of real estate tax paid by residents in most of the central municipalities of St. Petersburg is more than 1.5 times higher than the city average (Fig. 5). In such municipalities as Dvortsovyy district, No. 78, Smolninskoe (all in the Central District), Aptekarsky ostrov, Petrovsky, Chkalovskoe (all in the Petrogradsky District), this indicator is 2-5 times the average. High value of real estate is observed not only in the center of St. Petersburg, but also in a number of municipalities of Primorsky (municipality No. 65, Kolomyagi), Vyborgsky (Svetlanovsky municipality), Moscovsky (Zvezdnoye municipality), Krasnoselsky (Yuzhno-Primorsky municipality), Krasnogvardeisky (Pravoberezhny municipality),

Pushkinsky (Aleksandrovskaya rural settlement) districts. All these territories (with the exception of the Svetlanovskoye municipality) have seen active development over the past decade with new residential complexes being constructed.

High volumes of the property tax are also characteristic of a number of municipalities in the Kurortny district of St. Petersburg, stretching over 50 km along the northern shore of the Gulf of Finland. In the several summer house («dacha») settlements (Komarovo, Repino, Solnechnoye, Ushkovo, Molodezhnoye) the tax burden per inhabitant is 2.0 – 3.5 times the city average. At the same time, according to this indicator, the greatest contrasts are observed in the territory of the Kurortny district; along with the richest municipality of St. Petersburg, the poorest are located here. Thus, in the village of Pesochny, property tax payments are almost two times less than the average values in the city, and in the above-mentioned village of Smolyachkovo, by more than 8 times.

Low property tax per capita is characteristic of municipalities located in the old residential («sleeping») districts of St. Petersburg, where the majority of construction was done in the 1960-80s. In most of Kalininsky, Kolpinsky, Krasnoselsky, Petrodvoretsky, Nevsky districts and Kronstadt municipal districts, this indicator is 1.5-3.0 times less than the average value in the city. In this regard, the municipalities of the Krasnoselsky district are especially distinguished – Sosnovaya polyana and Gorelovo, where tax payments for real estate are 3.5 – 4.5 times lower than the average value.

Proportion of individual entrepreneurs to total employed population

The distribution of business owners in St. Petersburg is also characterized by a high degree of unevenness. Unfortunately, complete information on this category of persons is collected only during population censuses and is now somewhat outdated since nine years have passed since the last census. According to the 2010 census, only 2.2% of the employed population of St. Petersburg were entrepreneurs who have employed someone. The largest share of employers was noted in the suburban settlements of the «northern capital»: Ust-Izhora (Kolpinsky district), Repino, Solnechnoye, Komarovo (all in the Kurortny district of the city). In these villages, the share of entrepreneurs is 2-3 times the average value in St. Petersburg (Fig. 6).

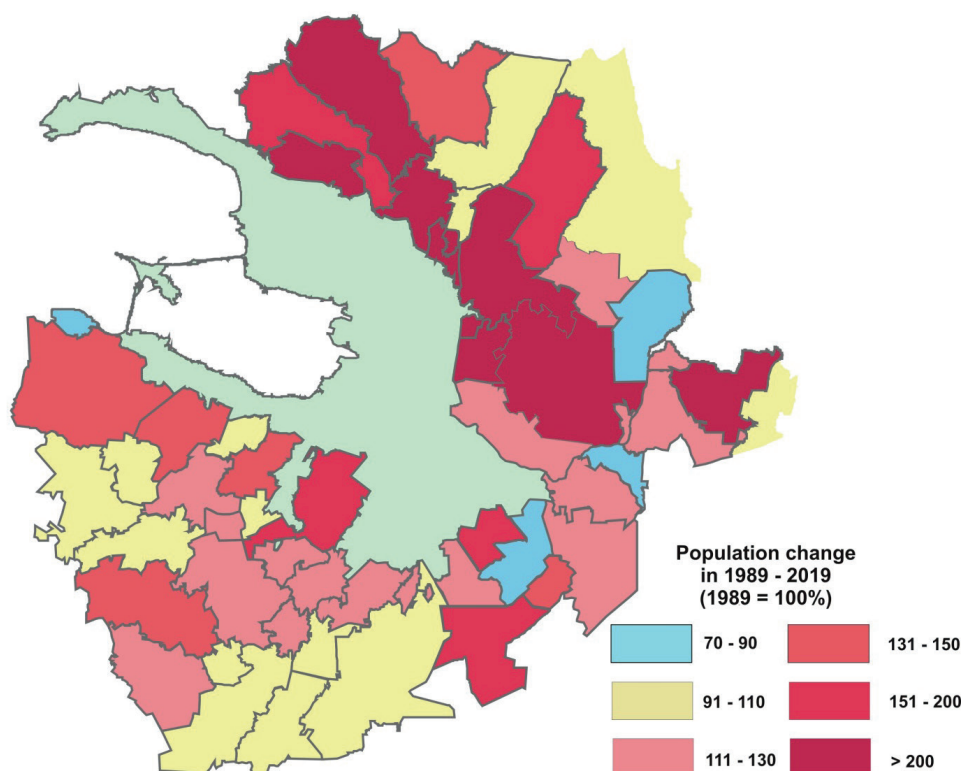


Fig.4. Population dynamics of suburban areas of St. Petersburg in 1989-2018

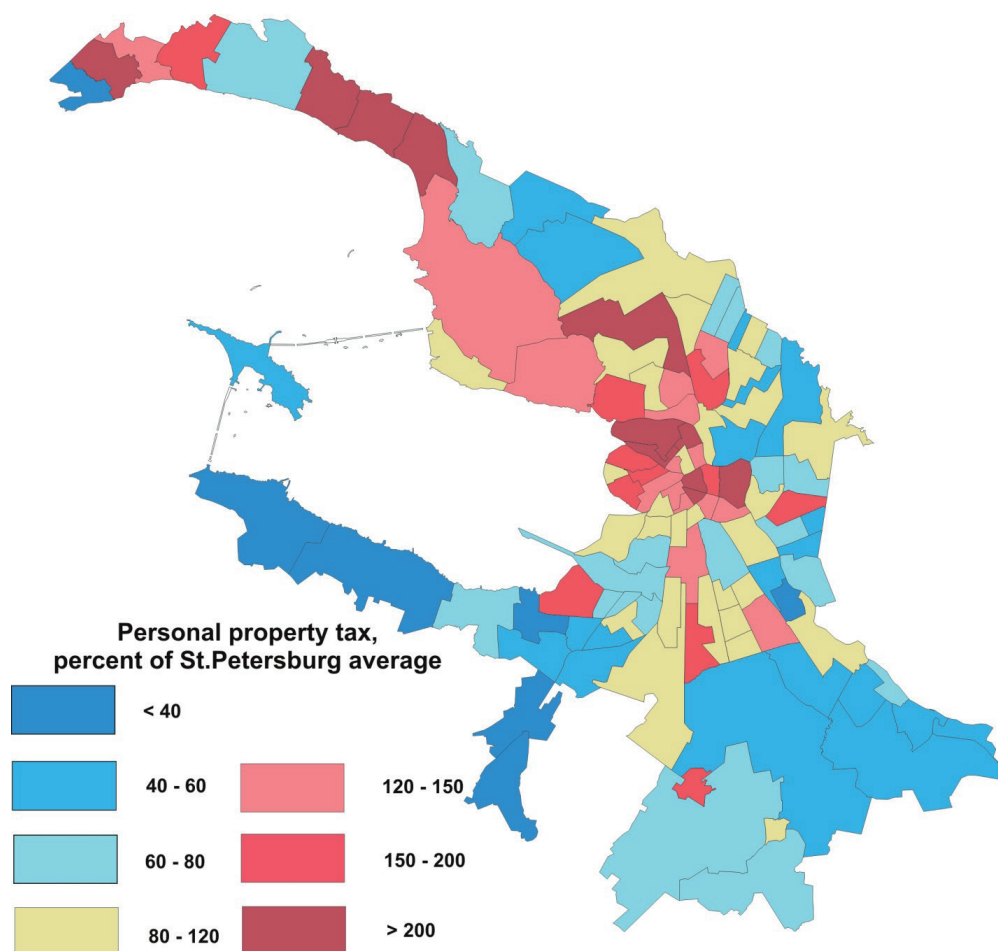


Fig. 5. Property tax in municipalities of St. Petersburg, 2016

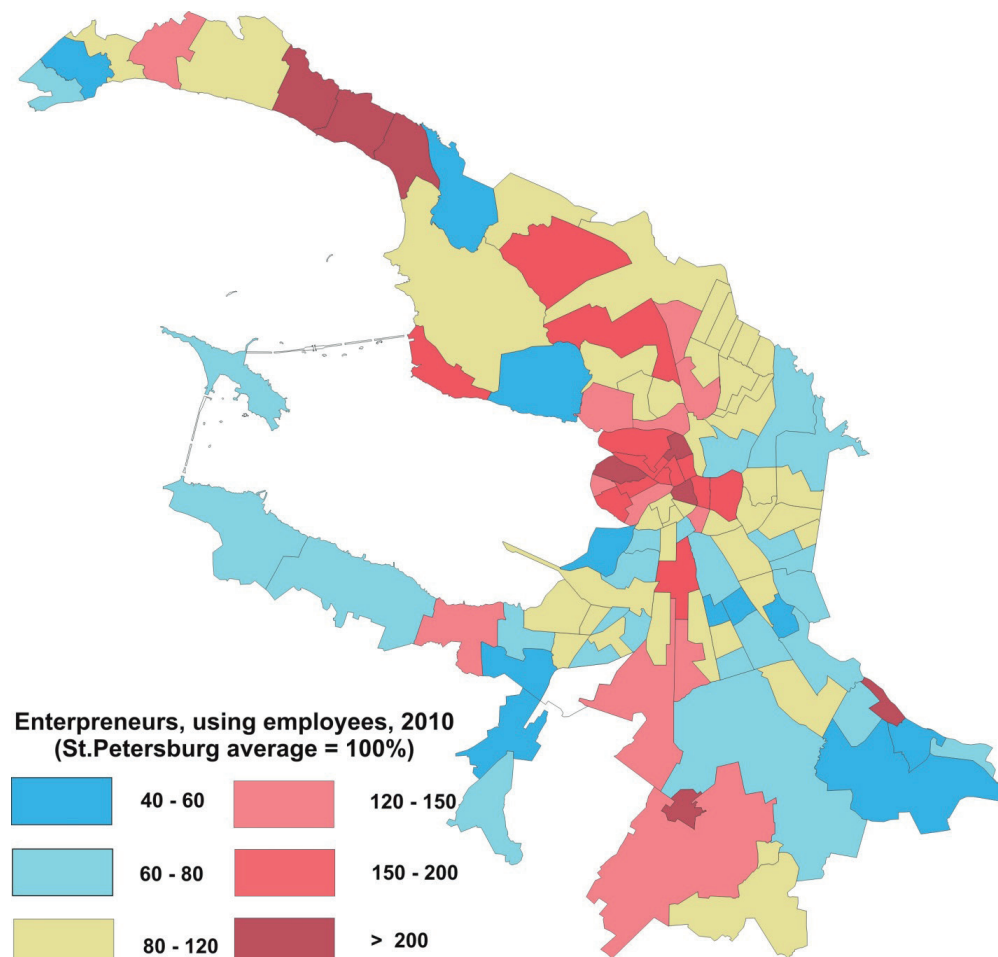


Fig. 6. The proportion of individual entrepreneurs hiring employees by the municipalities of St. Petersburg, 2010

The largest proportion of people hiring workers was registered for the Aleksandrovskaia village of the Pushkinsky district. Here, this category of persons includes almost 10% of the employed population. Among the districts of apartment buildings located directly in the city on the Neva River, more than twice the share of entrepreneurs is observed in the municipal districts of Petrogradsky (Aptekarsky ostrov municipality), Centralny (Petrogradsky municipality) and Vasileostrovsky (Ostrov Decabristov municipality) districts.

Cost of real estate

As has already been noted, for almost three decades of post-Soviet history in St. Petersburg there has been a marked stratification in terms of the quality of housing and its market value. At the same time, the market value of a building and its cadastral valuation, although related to each other, can vary considerably. According to CIAN¹, the cost of one square meter of residential housing at the beginning of 2019 varied across the municipalities of St. Petersburg² from 62.2 to 246.5 thousand rubles (Fig. 7).

Today the most expensive housing, expectedly, is located in the central part of the city – in the Petrogradsky, Centralny and Admiralteysky districts. The most fashionable district of St. Petersburg today is the Petrogradsky district (Central district), which occupies the territory of the historic part of the city between the Palace Embankment of the Neva and the beginning of Nevsky Avenue. The average cost of one square meter of housing today is almost 250 thousand rubles

(about 3.8 thousand US dollars). In recent years, however, the cost of real estate in the Petrogradsky district, and especially on the territory of Krestovsky Ostrov, which until recently was almost exclusively reserved for recreational functions, has been growing rapidly. Today this territory, which is a part of the Chkalovskoye municipal district, is experiencing rapid development through the construction of luxury residential properties that dominate residential areas around the Nevsky Avenue, the city's main street.

Outside the central areas of the city, high cost of real estate is observed along the main transport artery of St. Petersburg – Moskovsky Avenue – stretching almost 10 km to the south. The axis of expensive housing continues to the north of the city center along the line connecting the Chernaya rechka, Pionerskaya and Udelnaya metro stations. The beginning of Engels Avenue – one of the main transport lines of the northern part of St. Petersburg, and the surrounding neighborhoods at the cost of real estate (on average, 120-130 thousand rubles per 1 sq.m.) being similar to residential areas adjacent to Moscovsky Avenue.

The cheapest housing is located in the industrial suburbs of St. Petersburg, mainly in its southern areas. In the villages of Pesochny (Kurortny district), Pontonny, Saperny (both in the Kolpinsky district), the Krasnoe Selo City (Krasnoselsky district), the cost of one square meter of housing at the beginning of the second quarter of 2019 did not exceed 70 thousand rubles (1.1 thousand US dollars). Figure 7 shows the center-peripheral nature of the distribution of the cost of

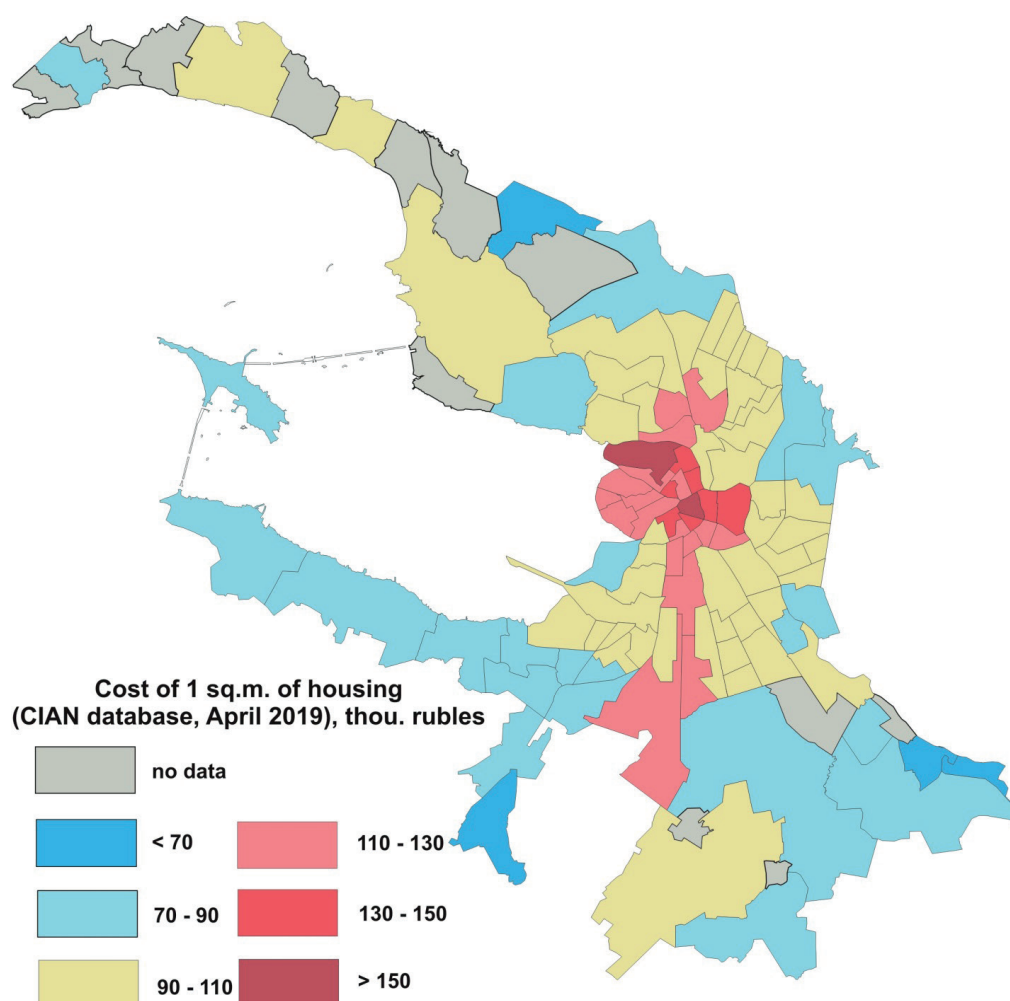


Fig. 7. The cost of housing in the municipalities of St. Petersburg, 2019

¹ A database of real estate – the largest in Russia, in general, and in St. Petersburg, in particular.

² There is no data on the cost of real estate in 12 municipalities of St. Petersburg – suburban settlements of Vyborgsky, Primorsky, Kurortny, Kolpinsky and Pushkinsky districts.

housing in St. Petersburg, with the separation of the axis of expensive housing in the direction from south to north.

Revenues of municipal budgets

By virtue of the system of budgeting of municipalities that has taken shape in the Russian Federation and the powers that are given to local governments, it is hard to talk about their financial viability. On average, more than a quarter of all budget revenues of municipalities of St. Petersburg are various transfers (subsidies, subventions, etc.) from higher-level budgets. In almost 20% of the municipalities of St. Petersburg, the share of such transfers exceeds 50% of the revenues of local budgets. At the same time, the amount and the proportion of subsidies to municipal budgets each year can vary in a very wide range. Therefore, to assess the level of well-being of municipalities and their financial independence, we consider the volume of own revenues of local budgets generated mainly from taxes on total income¹, property tax on individuals², income from the use of property owned by municipalities.

In 2017, the average size of budget revenues of municipalities of St. Petersburg amounted to 1,870 rubles per capita. In the city, this indicator varied in a very wide range from 767 rubles (Smolyachkovo rural settlement of the Kurortny district) to 18,382 rubles (Lakhta-Olgino municipality of the Primorsky district). Despite the 24-fold difference at the city level, the gap in the per capita revenues of local budget does not exceed 2.5 times for almost 75%

of the municipalities of the «northern capital». With that, only some of the most financially secure municipalities are located in the central part of the city (Fig. 8).

The richest municipalities of St. Petersburg in terms of revenues of local budgets are the cities and villages of the suburban areas: Kurortny (Komarovo, Repino, Solnechnoye, Beloostrov, Serovo, Sestroretsk, and Zelenogorsk), Kolpinsky (Saperny, Petro-Slavyanka, and Ust-Izhora) and Pushkinsky (Tyarlevo, Aleksandrovskaya). Low-income municipalities are concentrated in the northern (Primorsky, Vyborg, Kalininsky) and southern (Krasnoselsky, Frunzensky) residential districts of the city.

Level of education of the population

According to the latest census (2010), 56.1 thousand candidates and 12.9 thousand doctors of sciences lived in St. Petersburg. Among the age group of the population over 25 years old³, 18.4% on average held a scientific degree. The highest concentration of this category of persons was observed in the municipalities of the Petrogradsky and Centralny districts of the city – an average of 34–45 candidates and doctors of science per 1000 residents over 25 years old (Fig. 9).

In addition to the Centralny and Petrogradsky districts, a high (more than 50% of the average value in St. Petersburg) proportion of people with scientific degrees is observed in some municipal districts of Vasileostrovsky (Gavan, Morskoj municipalities), Admiralteysky district

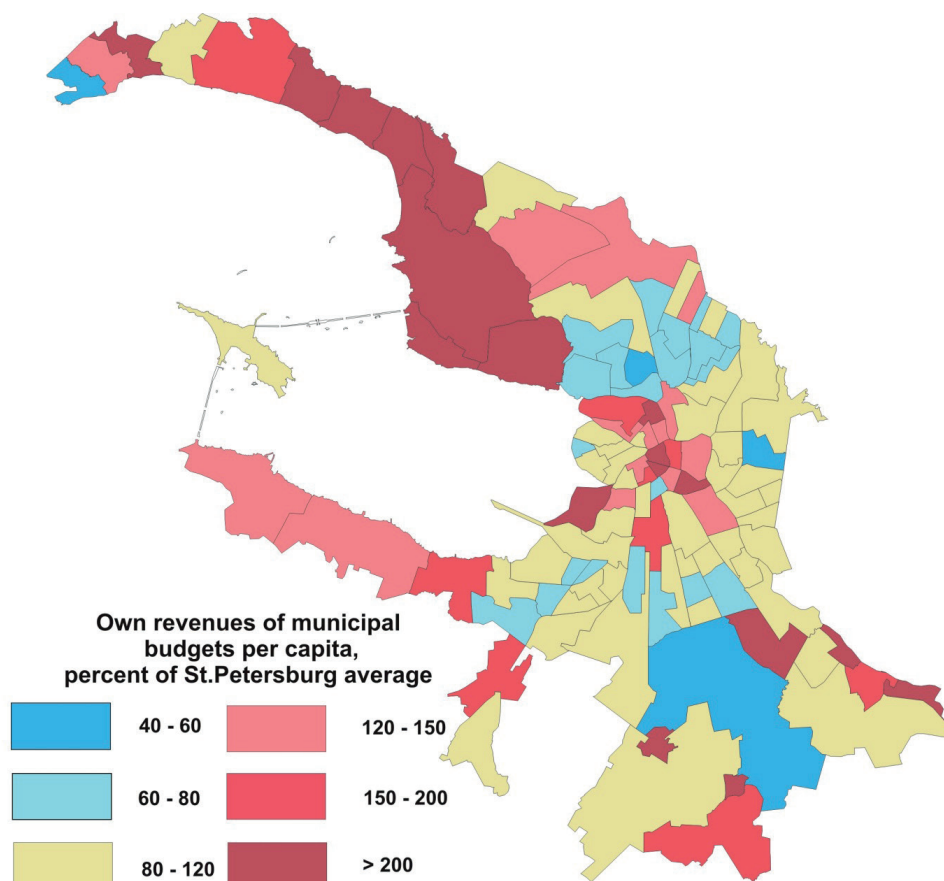


Fig. 8. Own revenues of municipalities of St. Petersburg per capita, 2017

¹ Taxes on gross income include tax levied with the use of a simplified system of taxation of enterprises and organizations; single tax on imputed income for certain types of activities; tax levied for the use of the patent system of taxation; single agricultural tax. Taxes on total income are only partially (the lesser part) transferred to the budgets of intracity municipalities of St. Petersburg. Most of this type of tax goes to the budget of St. Petersburg.

² Fully goes to the budgets of intracity municipalities of St. Petersburg.

³ Given the length of the secondary and higher education levels in the Russian Federation, it is almost impossible to get a degree at the age of less than 25 years. According to the 2010 census, among residents of St. Petersburg younger than 25 years of age there are no persons with a degree of candidate or doctor of science.

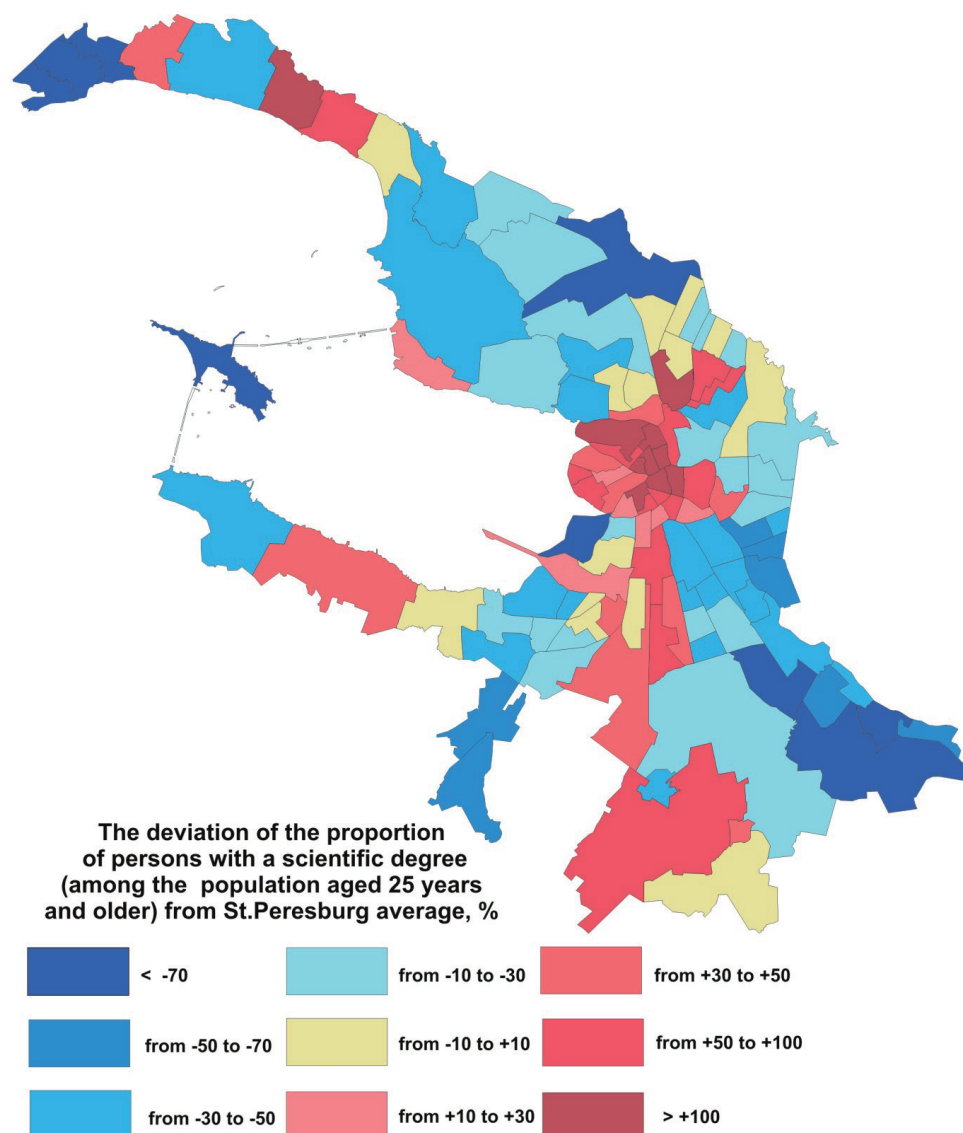


Fig. 9. Concentration of persons with a scientific degree in municipalities of St. Petersburg, 2010

(Sevvoy okrug, Admiralteysky district), Vyborgsky (Svetlanovskoe, Sampsonievskoe municipalities), Kalininsky (Akademicheskoe, Grazhdanka municipalities) and Moscovky (Moscovskaya Zastava, Zvezdnoye) districts. High concentration of academics is traditionally characteristic of such settlements in the Kurortny district of St. Petersburg, like Komarovo and Repino, as well as for the city of Pushkin¹. At the same time, municipalities of the Kolpinsky, Krasnoselsky, Nevsky and Frunzensky districts are characterized by a very low proportion of residents with a scientific degree.

The calculated level of the average rank of social well-being (ARSW) ranged from 2.6 (Dvortsovy okrug municipality of the Centralny district) to 107.3 (the Smolyachkovo Village community of the Kurortny District) (Fig. 10).

The most prosperous municipalities of St. Petersburg are located in the city center – in the Petrograd and Central districts. The most respectable territories also include the municipal district Moskovskaya Zastava (Moscow district) and the villages of Komarovo, Repino, Solnechnoye located in the Kurortny district. Municipalities of the southern part of the city – Kolpinsky, Nevsky, Krasnoselsky districts and Kronstadt have the worst indicators for the level of social well-being. Figure 10 shows that the social segregation that has been outlined so far in St. Petersburg has a clear spatial localization – the «poor» and «rich» municipalities are grouped in different parts of the city.

¹ Pushkin Municipality

Coastal location and social effects of urban municipalities

The entire territory of St. Petersburg fits within the 50 km coastal zone boundaries. The areas located on the coast of the Gulf of Finland (the inner crescent coastal municipalities) have a direct coastal position: Kronstadtsky district (Kotlin Island and the city of Kronstadt), Kurortny district (including the cities of Zelenogorsk and Sestroretsk, as well as a number of villages), Primorsky district, Petrogradsky district, Vasileostrovsky district, Kirovsky district, Krasnoselsky district, Petrodvoretsky district (including the city of Petrodvorets) and the city of Lomonosov.

The inner crescent coastal municipalities experience various, often conflicting, social and economic effects, including population growth (Primorsky, Krasnoselsky, Petrodvortsovy and Kurortny); reduction or stabilization of the population (Kirovsky, Petrograd, Vasileostrovsky, Kronstadt); high property taxes in «rich areas» (Kurortny, Primorsky, Petrograd) and low property taxes in «poor areas» (Lomonosov, Petrodvoretsky district, Kronstadt district, Kirovsky district); the most socially prosperous (Petrograd) and the least socially prosperous (Kronstadt district, Petrodvorets district, Krasnoselsky district) areas; the richest municipalities by income per capita (Kurortny district) and the poorest municipalities (Primorsky district, Krasnoselsky district, Kronstadt district).

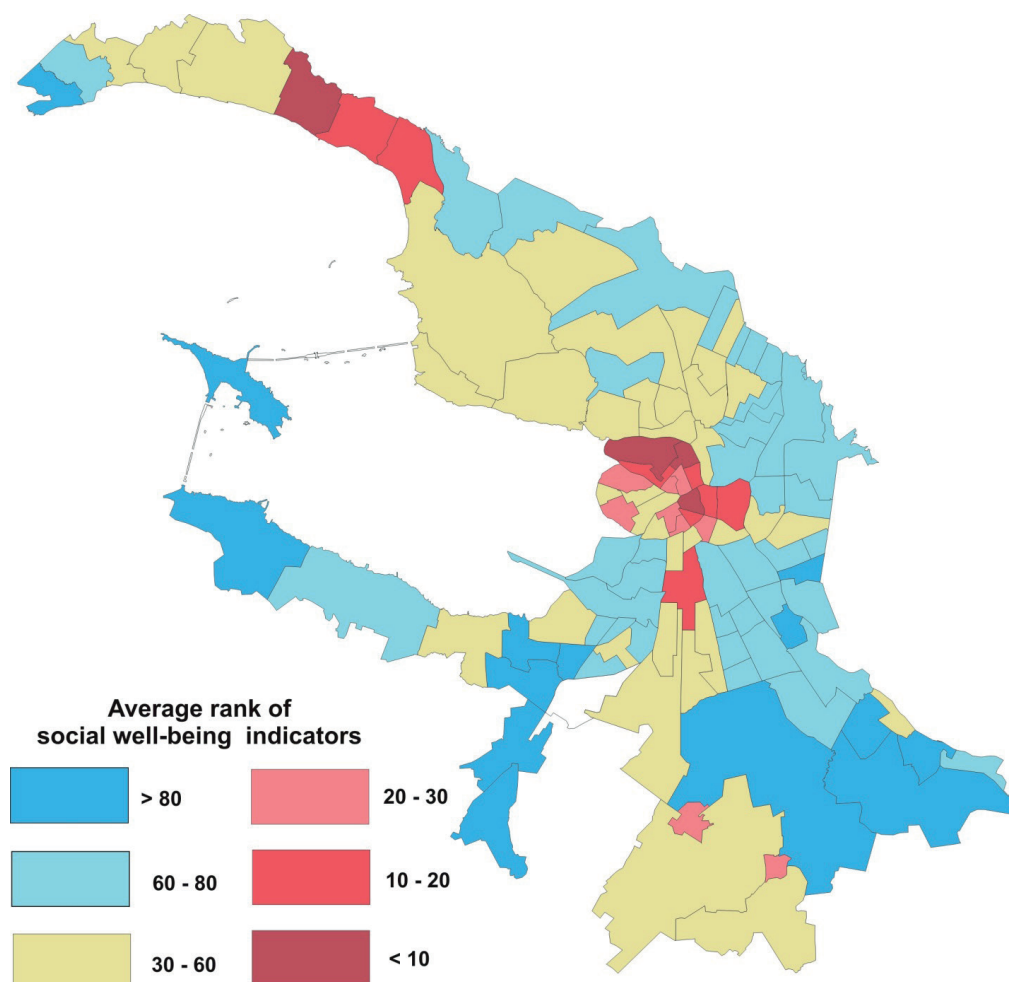


Fig. 10. Social well-being in St. Petersburg municipalities

The most ambitious construction projects of the 2000–2010s brought particular value to these territories. In the zone of coastal urban municipalities: «Western high-speed diameter» (2005–2016, connects the southwest and northwest territories), Gazprom Arena stadium (2007–2017, UEFA stadium of the 4th category); Lakhta Center (2012–2019, Gazprom headquarters); «Baltic Pearl» (a large residential neighborhood in the south-west of St. Petersburg has been under construction since 2005 with the participation of Chinese and Russian developers); «Marine Facade» (passenger sea port in St. Petersburg, located in the western part of Vasilevsky Island); State complex «Palace of Congresses» in Strelna (2000–2003) and others. The highest real estate value is characteristic of the Petrograd and Vasileostrovsky districts, where the most desired residences are located, including in the coastal zone, as well as in the Kurortny district, with its summer cottages and new townhouses. At the same time, in the remote Kronstadt and Petrodvorets districts, as well as the city of Lomonosov, the cost of real estate is at the lowest level. The presence of a naval base, facilities and warehouse infrastructure negatively affects not only the value of real estate on the territory of the Kronstadt region and the city of Lomonosov and incomes of its population, but also contributes to the marginalization of these territories. In the Soviet period, the city of Kronstadt had the status of a closed city, and the lack of land connection with St. Petersburg led to the fact that until now this area has the strongest negative social effects (since 2011, a dam has been opened that connects Kotlin Island with the north and south coast of the Gulf of Finland and is part of the St. Petersburg ring road).

Experience in the development of European ports shows that today they are betting on the shift of port capacities from the central part of the city and the development of outports. Ports marginalize urban areas, and it seems that St. Petersburg is following this trend. Within the boundaries of St. Petersburg, on the territory of the Kirovsky and Admiralteysky districts, port capacities and infrastructure for 50 million tons are located. In recent years, the development of port facilities in the Leningrad region (the city of Primorsk, the village of Ust-Luga, the city of Vysotsk), as well as in the village of Bronka (the city of Lomonosov) has accelerated. Containers are then shipped inland using the «dry port» technology (Shushary, Yanino, 30 km from the coastline).

CONCLUSIONS

The analysis of a number of key demographic and economic indicators for the period from 1989 to 2018 shows the increasing importance of center-peripheral trends in the development of the city and its immediate environment. These trends suggest that St. Petersburg is no exception in the series of post-socialist cities of Eastern Europe, which are undergoing profound socio-demographic and socio-economic changes, both in general and at the level of the spatial structure of the city. It can be stated that in accordance with the approach of K. Stanilov, St. Petersburg is developing in line with the West European and North American types of urbanization. The central districts of the city are losing population, but are experiencing an increase in business activity – offices of Russian and foreign companies, banks, business centers, and hotels. At the same time, due to the introduction of information technologies, the quality of public services in the internal residential areas is increasing.



Legend: Top left: Lakhta Center and Gazprom Arena; Top right: Marine Facade; Bottom left: Resort area; Bottom right: Western High-Speed Diameter and Gazprom Arena

Fig. 11. Key construction projects of the 2000-2010s

and large multifunctional shopping complexes are emerging, including leisure, food, trade, domestic services, and fitness. Signs of marked social segregation by income level appear, and the boundaries between such areas are becoming more visible.

After the collapse of the Soviet Union and the transition period of the 1990s, the territorial shifts in the distribution of the population of St. Petersburg and the transformation of its social structure at the lower administrative-territorial level suggest a significant increase in welfare differentiation and the development of natural segregation processes, social stratification, and a distinct formation of «rich» and «poor» territories.

A comparison of the five indicators of social well-being of the municipalities of St. Petersburg discussed above suggests that they are interrelated. With the help of correlation analysis, a high degree of mutual dependence between four of them was revealed. Thus, Pearson's correlation coefficient between the cost of housing and the proportion of people with a scientific degree, calculated for 111 municipalities of the city, was 0.813, between the cost of housing and the proportion of individual entrepreneurs with paid employees – 0.707, between the cost of housing and property tax paid

per inhabitant – 0.739. The only indicator that has a weak relationship with others (the correlation coefficient is in the range from 0.222 to 0.347) is the size of municipal revenues per capita. This circumstance only confirms the «opacity» of the formation of the revenue part of the budgets of local governments in St. Petersburg and the weak dependence of the size of municipal revenues on the welfare of local societies.

Based on the research results we are confident about the increasing social segregation in terms of the level of education of the population, the cost of real estate, and the income of local budgets. The significant spatial contrasts that have emerged in St. Petersburg pose a serious challenge to sustainable development of the city in the coming decades.

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