
POPULATION GEOGRAPHY

Territorial Concentration of Ethnic Groups in St. Petersburg

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Abstract—In recent decades, the ethnic structure of the population of St. Petersburg has significantly changed. As a result of assimilation, the number and share of some ethnic groups (Ukrainians, Belarusians, Tatars, Jews, etc.) in the city's population have decreased significantly. At the same time, the inflow of migrants from outside Russia has led to a substantial increase in the number of ethnic groups of the South Caucasus and Central Asia. The paper shows the location in St. Petersburg of representatives of the ten most numerous (after ethnic Russians) ethnic communities. The analysis was performed in 108 municipalities of St. Petersburg according to the 2010 census. An indicator of the uneven territorial distribution is the coefficient of ethnic localization, developed by the authors, which is calculated as the deviation of the share of representatives of a particular ethnic group from the city average. The paper represents the differences in spatial preferences for choosing the place of residence of representatives of various ethnic groups; the correlation indices of allocation of the ethnic communities under study were calculated. The authors propose a typology of the municipalities of the city based on the settlement preferences of the most numerous ethnic communities.

Keywords: St. Petersburg, ethnic group, ethnic community, municipalities, coefficient of ethnic localization, territorial concentration, settlement pattern

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Since the late 1990s, immigration has become an important factor in the demographic development of the Russian Federation. Against a negative natural increase, in some years reaching 800000 people per year, the inflow of migrants from outside Russia made possible to significantly reduce the depopulation rate of the country. So, for the period from 1992 to 2008, the positive migration balance offset the natural decrease on average by 53%, and in 2009–2012, it provided a positive natural increase [8].

Economic growth in the first decade of the 21st century dramatically increased the need for mobile and inexpensive labor force for all sectors of the economy. However the possibilities of interregional labor reallocation at the expense of internal migration were limited due to the undeveloped residential real estate market. Between 1991 and 2010, the gross turnover of domestic migration decreased by more than a factor of 2 [3, p. 135].

As socioeconomic development accelerated at the beginning of this century, Russia became attractive for migrants from indigenous ethnic groups of the CIS countries. This has led to an increase in immigration and a change in the ethnic composition of immigrants: whereas in the 1990s over 70% of migrants arriving in Russia for permanent residence were ethnic Russians and representatives of Russia's main ethnic groups, currently the majority of immigrants are representa-

tives of the main ethnic groups of CIS countries [4, p. 165].

The spatial localization of immigration flows in the Russian Federation was due to the difference in the attractiveness of Russian regions. Dynamically developing regions with the highest standard of living have become the centers of attraction both for domestic migrants and immigrants from abroad. At the same time, depressed regions with low investment activity and excess labor resources are not only unattractive for migrants, they also are centers of population outflow [5].

St. Petersburg is a region attractive for migrants, including those from abroad. This applies to persons arriving in the city for permanent residence, as well as to foreign workers temporarily residing in St. Petersburg. After a short period of depopulation in the early 1990s, St. Petersburg has a positive migration balance, which has reached in recent years (2011–2013) 58000–74000 people per year. Today, 30% of the migration inflow to St. Petersburg is from external migration [1, 2].

The inflow of immigrants over the past two decades has significantly changed the ethnic composition of the population of St. Petersburg. Despite the fact that from 1989 to 2010 the number of city residents was almost unchanged, the number of representatives of ethnic groups from the South Caucasus living in

Table 1. Ethnic composition of population of St. Petersburg

Ethnic group	1989		2010		Change in population size 1989–2010 (1989 = 1)
	population size, people	share, %	population size, people	share, %	
Russians	4448884	89.21	3908753	92.48	0.879
Ukrainians	150982	3.03	64446	1.52	0.427
Belarusians	93564	1.88	38136	0.90	0.408
Jews	106142	2.13	24132	0.57	0.227
Tatars	43997	0.88	30857	0.73	0.701
Chuvashes	8994	0.18	4610	0.11	0.513
Moldovans	5390	0.11	7200	0.17	1.336
Poles	7955	0.16	2647	0.06	0.333
Ethnic groups of North Caucasus, including	11004	0.22	16001	0.38	1.454
Chechens	1173	0.02	1482	0.04	1.263
Avars	1205	0.02	1971	0.05	1.636
Lezghins	1448	0.03	2814	0.07	1.943
Ossetians	2584	0.05	3233	0.08	1.251
Ethnic groups of Central Asia, including	21968	0.44	41046	0.97	1.868
Uzbeks	7927	0.16	20345	0.48	2.567
Tajiks	1917	0.04	12072	0.29	6.297
Kirghizes	2763	0.06	3289	0.08	1.190
Kazakhs	6331	0.13	3349	0.08	0.529
Turkmens	1360	0.03	1469	0.03	1.080
Ethnic groups of South Caucasus, including	32481	0.65	49128	1.16	1.513
Armenians	12070	0.24	19971	0.47	1.655
Azerbaijanis	11804	0.24	17717	0.42	1.501
Georgians	7804	0.16	8274	0.20	1.060
Total number of persons who reported their ethnicity	4986905	100.00	4226739	100.00	0.848
TOTAL	4990749	—	4879566	—	0.978

Compiled by authors using [6, 7, 9].

St. Petersburg increased 1.5 times; of ethnic groups from from Central Asia, almost 2 times. The number of representatives of ethnic groups from the North Caucasus has increased nearly 1.5 times over recent decades (Table 1). Among the ethnic groups whose size in the population of St. Petersburg in the period under review has significantly increased are Moldovans (33%), Koreans (36%), and Chinese (a 17-fold increase¹).

When analyzing changes in the ethnic composition of the population of St. Petersburg in recent decades,

¹ According to the official data, in 2010, the Chinese population of St. Petersburg was not great, 1578 persons, but in 1989 there were only 93 Chinese in the city.

it should be noted that the increase in the representation of certain ethnic groups was accompanied by a decrease in the population size of other groups. Thus, from 1989 to 2010, the number of Ukrainians and Belarusians who lived in St. Petersburg and held, according to the 1989 census, second and fourth place in the population size among the ethnic groups of the city, decreased by more than a factor of 2. The Jewish population decreased by a factor of 4 in this period (second place among the ethnic groups of the population in 1989). The population size of Finns and ethnic groups of Volga region (Tatars, Mordvinians, Chuvashes, Mari, Udmurts) decreased by a factor of 1.5–2.0; Karelians, Poles, and Baltic ethnic groups (Lithuanians, Latvians, Estonians) decreased by a fac-

tor of 2.5–3.0. Thus, it is significant for these ethnic groups that they showed not only a decrease in the share of the population of St. Petersburg, but also a reduction in absolute size [7, p. 27]. The reason is assimilation, rapidly flowing into a megalopolis. Today, among the ten most numerous (except for ethnic Russians) ethnic groups living in St. Petersburg, eight represent the main ethnic groups of the former Soviet republics (Table 1).

A peculiarity of the last census in 2010 in respect to St. Petersburg was not only the fact that it took into account not the entire population of the city at the time², but also that a large number of people did left a lot of blank spaces on the questionnaire. For example, information on marital status was available for only 88% of St. Petersburg citizens. The data on economic activity was obtained only for 85% of the residents aged 15 to 72 years; data on education, on 90% of the population over the age of 15 years. There is no information on competency in languages for 12% of the population of St. Petersburg. Also, the question of ethnic identity in the 2010 census in St. Petersburg was not answered by 13.4% of the population [6]³.

Such a large percentage of people who did not answer such questions can only be explained by the fact that enumerators did not communicate directly with those citizens, and the information about them (gender, age) was obtained from other sources.

However, over the past two decades, changes have taken place not only in the ethnic composition of the population of St. Petersburg, the settlement pattern of various ethnic groups has also changed. The 1989 census data makes it possible to consider the national composition only in the context of city districts and particular municipal settlements within the city⁴.

There were 21 such settlements at that time⁵. Information on the population of St. Petersburg in 2010 makes it possible to carry out a more detailed study of the different demographic characteristics in the territorial aspect: census data are available for 111 intracity municipal units⁶. At the same time, the area and population size of municipal units varies in a very wide range. Thus, the population size of the city's numerically smallest municipal unit, the settlement of Serovo (Kurortnyi district), is only 280 people, and the most populous municipal district, the city of Kolpino (Kolpino district), is nearly 140 000 inhabitants. The areas

of the municipalities of St. Petersburg can also vary by tens of times (from 0.3 to more than 100 km²).

How uniform is the settlement pattern of various ethnic groups in St. Petersburg? Are there preferences in their choice of residence? Does the geography of the accommodation of various ethnic groups coincide in the city's territory? To answer these questions, we need to consider the level of concentration of the most numerous ethnic groups by municipality. For greater objectivity, we eliminate from the list of areas the most poorly populated municipal units with a population of less than 1000 people⁷. There were three such territories in St. Petersburg in 2010: the settlements of Serovo (280 inhabitants), Smolyachkovo (609 inhabitants), and Ushkovo (613 inhabitants)⁸.

As an indicator of the territorial homogeneity of a settlement pattern of a particular ethnic group, we suggest using *the coefficient of ethnic localization* (similar to the coefficient of industrial localization). The coefficient of ethnic localization (C_{el}) is calculated as the ratio of the share of an ethnic group j in the population of a municipal unit i to the share of this ethnic group in the population of the city:

$$C_{el\ ij} = (P_{ij}/N_i)/(P_j/N),$$

where P_{ij} is a population size of an ethnic group j on the territory of a municipal unit i ; N_i is a number of the inhabitants of municipal unit i who have specified their national identity in the census; P_j is a total number of representatives of ethnic group j in St. Petersburg; N is the total number of residents who have specified their ethnic identity in the census.

In theory, the coefficient of ethnic localization can change from 0 to positive infinity, but in reality its upper limit does not exceed two-digit numbers. A value of $C_{el} = 1$ indicates that the share of representatives of the ethnic group in the municipal unit does not differ from the average in the city. A value of $C_{el} = 0$ means that there are no representatives of the said ethnic group in the given municipal unit. A value of C_{el} greater than 1 means that the concentration of the ethnic group in the given municipal unit is greater than the average value in the city in the number of times equal to the value of this coefficient.

Taking into account the possibility of random combinations of settlement patterns of ethnic groups, we assume that if C_{el} is in the range from 0.5 to 2.0, there are no territorial settlement preferences of this ethnic group. The value of the coefficient of ethnic localization outside the above-mentioned range, i.e., deviation from the average in the city by more than a factor of 2, makes it possible to determine the selectivity in

² Many, if not most, migrants from other regions of Russia and foreign countries were not taken into account in the 2010 census.

³ In the 1989 census, only 0.08% of the population did not answer the question of their ethnic identity.

⁴ Municipal settlements Lisii Nos, Levashovo, and Pargolovo.

⁵ Including cities (Kolpino, Kronstadt, Petrodvorets, Pushkin, Sestroretsk, etc.), which were administrative units of Leningrad.

⁶ 81 municipal districts, 9 towns, and 21 settlements.

⁷ When a given territory has a low population, the presence of even a few people of the studied ethnic group can significantly change the indicator of ethnic concentration, thus affecting the objectivity of the results.

⁸ All of these settlements are located in the Kurortnyi district of St. Petersburg.

Table 2. Concentration of settlement of ethnic groups throughout St. Petersburg, 2010

Ethnic group	Number of St. Petersburg municipalities with a level of concentration of the ethnic population relative to the city average (average for St. Petersburg = 1)					Average linear deviation
	less than 0.2	0.2–0.5	0.5–2.0	2.0–5.0	more than 5.0	
Ukrainians	0	2	103	3	0	0.26
Belarusians	0	2	105	1	0	0.23
Tatars	0	1	104	3	0	0.24
Jews	10	19	70	9	0	0.57
Uzbeks	6	26	61	9	6	1.39
Tajiks	12	35	49	7	5	1.10
Armenians	0	4	97	6	1	0.44
Azerbaijanis	3	10	92	3	0	0.36
Georgians	2	15	77	14	0	0.52
Moldovans	2	22	70	9	5	0.89

Compiled by authors using [6].

the choice of place of residence: the phenomenon of ethnic concentration. In contrast to the notion of ethnic localization, which characterizes a separate territory within a city, the notion of ethnic concentration is a characteristic of a city as a whole, which can be determined by analyzing variations of the coefficients of ethnic localization.

According to the 1989 census, none of the ethnic groups of the population had obvious preferences for settlement in the territory of Leningrad. A more than twofold deviation in C_{el} from the city average was typical of some ethnic groups only in remote districts. Thus, only in the city of Kronstadt and the settlement of Levashovo was the C_{el} value of Ukrainians two to three times higher than the city average. The ethnic concentration was much lower than normal (C_{el} less than 0.5) in 1989 only in the settlements of Levashovo and Pargolovo (Vyborgskii district), in the city of Kronstadt, and in Kolpino and Petrodvorets districts; this was also typical of the settlement pattern of Georgians and Jews [9].

The 2010 census showed a completely different situation. Already at the level of urban districts of St. Petersburg a spatial nonuniformity in the distribution of certain ethnic groups was observed. Thus, in Vyborgskii and Kurortnyi districts, the share of Tajiks in the total population was higher than the average for St. Petersburg by more than a factor of 2, and the share of Uzbeks and Moldovans, more than a factor of 3. The increased concentration of Tajiks and Moldovans (two to three times higher than the average values of the city) has also been observed in Primorskii district. Similar rates are typical of Georgians and Jews in the Central district of St. Petersburg [6].

On the other hand, a reduced concentration of ethnic groups from Central Asia is observed in the Kirovskii, Krasnoe Selo, Kolpino, Frunzenskii, and

Petrodvorets districts. In the Kolpino, Kronstadt, and Krasnoe Selo districts, the share of Georgians and Jews is several times less than the average for St. Petersburg.

Consideration of the ethnic composition of the population at the level of municipalities makes it possible to specify the territorial preferences of different ethnic groups. First of all, it should be noted that the degree of uniformity of settlement patterns of the most numerous ethnic groups in St. Petersburg varies notably. Among the ethnic communities distributed evenly throughout the city are Tatars, Ukrainians, and Belarusians. Thus, the share of Tatars deviates more than twofold from the average for St. Petersburg only in 4 out of 108 municipalities. At the same time, there are 47 such territories for the ethnic Uzbek community, and 59 for Tajiks. The high degree of nonuniformity is inherent to the settlement patterns of the Jewish, Moldovan and Georgian communities of the city. The Armenian and Azerbaijani ethnic communities are less selective in terms of place of residence. Calculation of the average linear deviation⁹ of the share of different ethnic groups of 108 St. Petersburg municipalities has shown that the lowest value of this indicator is typical of Belarusians, Tatars, and Ukrainians (0.23–0.26); it is highest for Moldovans, Uzbeks, and Tajiks (0.89–1.39). For other ethnic groups of the city population, this value is in the range of 0.36–0.57 (Table 2).

Figures 1–3 show the territorial features of settlement patterns of the main ethnic communities of St. Petersburg. The formation of areas of concentration of various ethnic groups on the territory of the city should be noted. The maximum C_{el} values of the eth-

⁹ The indicator of the spread of values of a data set around their average.

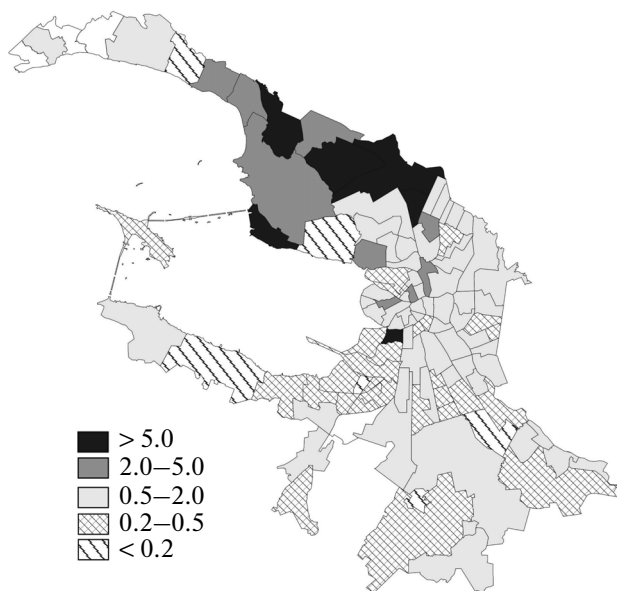


Fig. 1. Coefficient of ethnic localization of ethnic Uzbek group throughout St. Petersburg municipalities, 2010.

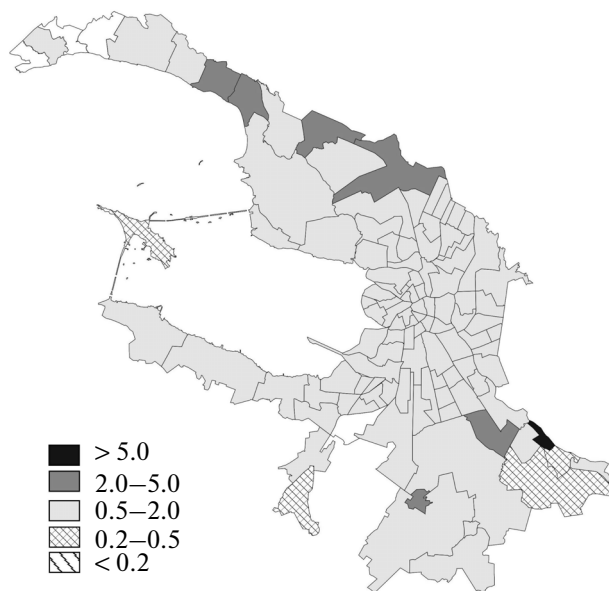


Fig. 2. Coefficient of ethnic localization of ethnic Armenian group throughout St. Petersburg municipalities, 2010.

nic Uzbek community in St. Petersburg fall on the northern areas of the city: Vyborgskii, Primorskii, and Kurortnyi districts. In half the municipalities of these ¹⁰ districts, the concentration of the ethnic Uzbek population is twice the city average; in five municipalities, there is a more than fivefold excess. Twenty-one percent of the population of St. Petersburg and almost half the entire population of the ethnic Uzbek community fall on these three districts. Thus, in the municipal unit of the settlement of Pargolovo, according to official 2010 census data, Uzbeks represent 7.7% of the total population, and in the settlement of Beloostrov, 12.1%. Meanwhile, the southern districts of St. Petersburg, such as Kirovskii, Krasnoe Selo, Petrodvorets, Moskovskii, and Frunzenskii, are notable for a small concentration of the ethnic Uzbek population. The C_{el} value of Uzbeks there is two to three times less than the city average (Fig. 1).

A similar situation is observed in the settlement pattern of the Tajik and Moldovan communities throughout St. Petersburg. For these, 51% of all Tajiks and 46% of Moldovans live in three northern districts (Vyborgskii, Kurortnyi, and Primorskii). The concentration of the ethnic Tajik and Moldovan populations is two to four times higher than the city average. In some municipalities, their concentration is even higher. Thus, the C_{el} value for Tajiks in Pargolovo (Vyborgskii district) is 7.9; in the municipality of Kolomyagi (Primorskii district), 7.2; and in Beloostrov (Kurortnyi district), 22.0. The maximum concentration of the Moldovan population in St. Petersburg is observed in the following municipal units: No. 65 (Pri-

morskii district), settlement of Aleksandrovskaya (Pushkin district), and Pargolovo. The C_{el} values for Moldovans in these municipalities are, respectively, 7.7, 7.4, and 7.2. Like Uzbeks, the lowest concentration of the Tajik population is in the southern districts of the city: Kirovskii, Krasnoe Selo, Petrodvorets, Moskovskii, and Frunzenskii. The negative selectivity in the settlement pattern of Moldovans in St. Peters-

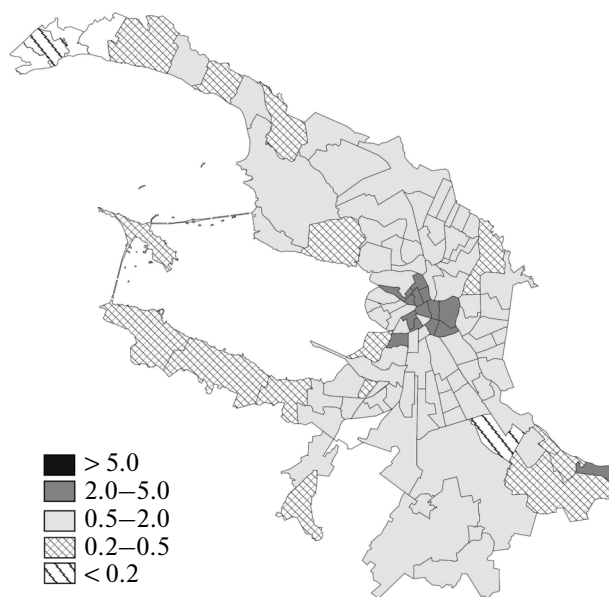


Fig. 3. Coefficient of ethnic localization factor of ethnic Georgian group throughout St. Petersburg municipalities, 2010.

¹⁰ In 12 out of the 24 municipalities under study.

burg somewhat differs from the ethnic groups from Central Asia. In addition to the Moskovskii and Kirovskii districts, the minimum C_{el} values of Moldovans are in the municipalities of the Central district (Liteinyi okrug, Smolninskoe), Petrogradskii district (Vvedenskii, Posadskii, Petrovskii okrug, Chkalovskii), and Primorskii district (Komentantskii Aerodrom, Yuntolovo, Kolomyagi, and Ozero Dolgoe).

The settlement pattern of ethnic groups from the South Caucasus looks different. The Armenian population is distributed most evenly throughout the city. In only 11 out of 108 municipalities of St. Petersburg does the density of the Armenian ethnic community deviate more than twofold from the city average. Meanwhile, the highest and lowest C_{el} values for Armenians are in the suburbs. Most of these suburbs (the settlements of Pargolovo, Solnechnoe, Repino, Pesochnoe, Petro-Slavyanka, Pontonnyi, Ust'-Izhora, Aleksandrovskaia) have a small population, which increases the possibility of random fluctuations in the ethnic composition (Fig. 2).

The settlement pattern of the ethnic Azerbaijani community is also fairly homogeneous. The concentration of Azerbaijanis is 2.0–2.5 times higher than the city average in only three municipalities (Yekaterinogfskii (Admiralteiskii district), Obukhovskii, and No. 54 (Nevskii district)). Most municipalities with a C_{el} value of Azerbaijanis of 0.5 or less, as in the case of the Armenian community, are in the suburbs (the municipal units of Kronstadt, Strelna, Lomonosov, Krasnoe Selo, Aleksandrovskaia, Sapernyi, Zelenogorsk, Komarovo, Pesochnoe, and Lakhta-Olgino).

In contrast to Armenians and Azerbaijanis, the Georgian community of St. Petersburg is concentrated mainly in the central part of the city. A quarter of the Georgian ethnic population live in three districts of the historical part of St. Petersburg, such as the Admiralteiskii, Petrogradskii, and Central districts, the population size of which is only 10% of the total population of the city. The C_{el} value for Georgians is more than twice the city average in 11 out of 17 municipalities of these districts. The negative settlement selectivity of the Georgian community, as well as of the Armenian and Azerbaijani communities, is inherent to the municipalities in the outskirts and suburbs of St. Petersburg (Krasnoe Selo, Kolpino, Petrodvoretz, Lomonosov, Strelna, Kronstadt, Zelenogorsk, and others) (Fig. 3).

A high degree of nonuniformity is inherent to the settlement pattern of the ethnic Jewish population of the city. In nine municipalities, the C_{el} value of Jews is greater than 2, and in 29, less than 0.5. At the same time, in ten municipalities, the concentration of the ethnic Jewish population is more than five times less than the city average. The settlement pattern of the Jewish population of St. Petersburg is characterized by its increased concentration in the Central district and some municipalities of Vyborgskii district (Svetl-

anovskoe), Krasnogvardeiskii district (Rzhevka), Moskovskii district (Gagarinskoe), as well as in Komarovo (Kurortnyi district). The suburban municipalities (Kolpino, Shushary, Petro-Slavyanka, Gorelovo, Kronstadt, Molodezhnoe, and others) have the minimum density of the ethnic Jewish population, or a complete absence thereof.

In contrast to the mentioned ethnic groups, Ukrainians, Belarusians and Tatars have the most even settlement pattern in St. Petersburg. Nine out of 11 municipalities in which the concentration of Ukrainians, Belarusians, and Tatars differs from the city average more than twofold are small settlements located on the northwest (Komarovo, Solnechnoe, Beloostrov, Lisii Nos, Lakhta-Olgino, and Pargolovo) or southeast (Tyarlevo, Petro-Slavyanka, and Ust'-Izhora) outskirts of St. Petersburg.

Analysis of the location of the main ethnic groups makes it possible to mark out several types of city areas by the degree of attractiveness to ethnic communities. The basis of the typology is the classification of the 108 municipalities of St. Petersburg by two additionally calculated indicators, which reflect the level of ethnic concentration of the most numerous ethnic communities of the city. The first indicator is calculated as the sum of C_{el} values for the ten studied ethnic groups; the mean value is 10. The second indicator is related to a significant (more than two times) deviation of the C_{el} value upward or downward from the city average for individual ethnic groups. As a result, in accordance with the specified indicators, all St. Petersburg municipalities can be divided into six types, two of which are characterized by an increased territorial concentration of ethnic communities in general, and other two, by a decreased share of ethnic minorities. Yet another type of municipality is defined as "neutral," having both of the considered indicators, which are close to the city average. The last type is characteristic of the areas with a high concentration of certain ethnic groups and a small share of others.

The first type includes 36 municipalities in which 9 out of the 10 ethnic groups show a deviation of concentration to any side by not more than twice the city average (the C_{el} value is less than 2.0 and greater than 0.5). Such municipalities are located in central and northeast St. Petersburg: Vasileostrovskii, Kalininskii, Krasnogvardeiskii, Admiralteiskii, and Frunzenskii districts (Fig. 4).

The second and third types, respectively, make up three and eight municipalities of the city where the concentration of ethnic communities is significantly higher than the average for St. Petersburg (Table 3). These are, first of all, the territories of Kurortnyi, Primorskii, and Vyborgskii districts. Of the eight municipalities having the largest sum of C_{el} values for the ethnic groups under study, seven are in northwestern St. Petersburg: the municipal units No. 65 and Kolomyagi (Primorskii district), Shuvalovo-Ozerki (Vyborgskii district), as well as the suburban settle-

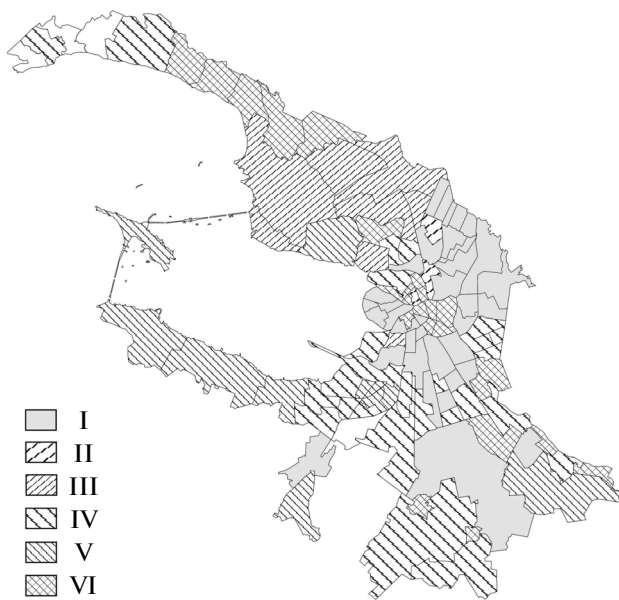


Fig. 4. Types of St. Petersburg territories according to degree of attractiveness for ethnic communities.

ments of Lisii Nos (Primorskii district), Levashovo, Pargolovo (Vyborgskii district), and the city of Sestroretsk (Kurortnyi district). An exception is the municipality of Yekateringofskii (Admiralteiskii district) in central St. Petersburg, where the concentration of Moldovans, Georgians, and Azerbaijanis is more than twice the city average, and the concentration of Uzbeks and Tajiks, more than a factor of 5 (Fig. 4).

In southwest of St. Petersburg (Kirovskii and Krasnoe Selo districts), in the greater part of Moskovskii, Nevskii and Frunzenskii districts there is a small share of the most ethnic groups under study (the fourth type). The lowest concentration of ethnic communities (the fifth type) is typical of the municipalities Knyazhevo, Dachnoe, Krasnenkaya rechka (Kirovskii district), Yugo-Zapad (Krasnoe Selo district), and for such suburbs of St. Petersburg as Kronstadt, Lomonosov, Petrodvorets, Strelna, Krasnoe Selo, and Kolkpino (Fig. 4).

The sixth type of areas includes municipalities of mixed type. Some ethnic communities there have an increased concentration, while others are hardly represented. Thus, for five of the six municipalities of the Central district, the C_{ei} value for Georgians and Jews is greater than 2.0, while the share of Uzbeks, Tajiks, and Moldovans is 1.5–2.5 times less than the norm. A similar situation is observed in the municipalities of Petrogradskii district, and in the municipal units of Admiralteiskii okrug (Admiralteiskii district), Gagarinskoe (Moskovskii district), and Komarovo (Kurortnyi district). Another relationship between the shares of different ethnic groups has formed in some settlements of Kurortnyi district (Beloostrov, Pesochnoe, Repino,

Solnechnoe): a high share of immigrants from the labor migration countries (Uzbekistan, Tajikistan, Moldova) is combined there with a low ethnic density of other ethnic groups. There is also a sharp contrast in the concentration of different ethnic groups in the municipalities of Yuntolovo (Primorskii district), Obukhovskii (Nevskii district), No. 53 (Nevskii district), and in several suburban settlements located in the southern St. Petersburg (Tyarlevo, Aleksandrovskaya, Petro-Slavyanka, Ust'-Izhora, Sapernyi) (Fig. 4).

The spatial concentration of ethnic groups in St. Petersburg shows not only the selectivity of places of residence by ethnic groups, but also their different compatibility. Correlation analysis of the coefficients of ethnic localization for the ten ethnic groups throughout the 108 municipalities of St. Petersburg showed certain patterns in the territorial distribution of the different ethnic groups (Table 4).

Thus, the Uzbek and Tajik communities have the closest spatial coincidence in St. Petersburg, which is quite understandable taking into consideration the origin and social status of the majority of their representatives. The correlation factor there is 0.89. The medium values of the correlation factor (0.5–0.7) are observed when comparing the spatial concentration of Moldovans and Ukrainians, Moldovans and Armenians. The correlation throughout the city for other ethnic groups is either weak (0.2–0.5) or absent (less than 0.2).

From the above evaluations, the following conclusions can be drawn:

(1) The ethnic structure of the population of St. Petersburg over the past two and a half decades has undergone significant changes. Under constant ethnic Russian domination, the population size and share of other ethnic groups in the city have changed many times. This was favored not only by the continuing assimilation of some ethnic communities of Russia (Tatars, Jews, Chuvashes) and of near-abroad countries (Ukrainians, Belarusians), but also by a significant migrant inflow of citizens from Central Asian states to St. Petersburg (Uzbekistan, Tajikistan, Kyrgyzstan) and the South Caucasus (Armenia, Azerbaijan).

(2) Changes in the composition of ethnic groups is accompanied by their redistribution throughout the city. Whereas the 1989 census does not make possible to demarcate delimitate in St. Petersburg areas of concentration of a particular ethnic group, the results of the 2010 census show an uneven distribution throughout the city of some fairly numerous ethnic groups. Today it is too early to speak about the formation of St. Petersburg ethnic quarters like those existing in Paris, London, New York, and other megalopolises of Europe and North America, but the selectivity of residence is already inherent to many ethnic communities. In some municipalities of St. Petersburg, such as Yekateringofskii (Admiralteiskii district); Pargolovo,

Table 3. Types of St. Petersburg municipalities according to degree of concentration of ethnic groups

District	Number of municipalities by territorial type						Total
	I	II	III	IV	V	VI	
Admiralteiskii	4	—	1	—	—	1	6
Vasileostrovskii	5	—	—	—	—	—	5
Vyborgskii	3	2	3	—	—	—	8
Kalininskii	7	—	—	—	—	—	7
Kirovskii	1	—	—	3	3	—	7
Kolpino	1	—	—	1	1	3	6
Krasnogvardeiskii	5	—	—	—	—	—	5
Krasnoe Selo	1	—	—	4	2	—	7
Kronstadt	—	—	—	—	1	—	1
Kurortnyi ¹¹	—	—	1	2	—	5	8
Moskovskii	1	—	—	3	—	1	5
Nevskii	2	—	—	5	—	2	9
Petrogradskii	—	1	—	1	—	4	6
Petrodvorets	—	—	—	—	3	—	3
Primorskii	1	—	3	2	1	1	8
Pushkin	1	—	—	2	—	2	5
Frunzenskii	3	—	—	3	—	—	6
Central	1	—	—	—	—	5	6
Total	36	3	8	26	11	24	108

Compiled by authors using [6].

Table 4. Correlation of settlement of ethnic groups throughout St. Petersburg in 2010: correlation coefficients

Ethnic group	Ukrainians	Belarusians	Azerbaijanis	Armenians	Uzbeks	Tajiks	Moldovans	Tatars	Georgians	Jews
Ukrainians	X	0.401	-0.195	0.205	0.386	0.171	0.595	-0.004	0.043	-0.130
Belarusians	0.401	X	-0.148	-0.070	0.318	0.273	0.511	0.128	-0.220	-0.082
Azerbaijanis	-0.195	-0.148	X	0.161	0.126	0.110	-0.023	-0.111	0.035	-0.083
Armenians	0.205	-0.070	0.161	X	0.184	0.144	0.508	0.219	0.021	-0.089
Uzbeks	0.386	0.318	0.126	0.184	X	0.890	0.432	-0.049	-0.025	-0.160
Tajiks	0.171	0.273	0.110	0.144	0.890	X	0.299	-0.009	-0.040	-0.176
Moldovans	0.595	0.511	-0.023	0.508	0.432	0.299	X	0.053	-0.143	-0.229
Tatars	-0.004	0.128	-0.111	0.219	-0.049	-0.009	0.053	X	0.069	0.301
Georgians	0.043	-0.220	0.035	0.021	-0.025	-0.040	-0.143	0.069	X	0.375
Jews	-0.130	-0.082	-0.083	-0.089	-0.160	-0.176	-0.229	0.301	0.375	X

Calculated by authors.

Levashovo, and Shuvalovo-Ozerki (Vyborgskii district); and Beloostrov (Kurortnyi district), the share of ethnic groups from Central Asia, the South Caucasus, as well as Moldovans, according to the official data of the last census (2010) alone was more than 7%, three

¹¹ Excluding the settlements of Serovo, Smolyachkovo, and Ushkovo.

to six times higher than the city average. Actual indicators of the presence in the city of immigrants from the former Soviet republics is much higher, since many newly arrived migrants were not included in the 2010 census. An indirect confirmation of this is the large number of residents of St. Petersburg who did not indicate their ethnic status; i.e., they were counted in

absentia by the primary administrative data. Thus, if the average share of people in St. Petersburg who did not indicate their ethnic status according to the 2010 census was 13.4% of the total population, in some city municipalities (No. 65, Chernaya Rechka, Kolomyagi, and Yuntolovo (Primorskii district); No. 7 and Vasil'evskii (Vasileostrovskii district); and Nevskaya Zastava, and Ivanovo (Nevskii district)), this value reached 35–45% [6].

(3) Of the ten most numerous ethnic communities of St. Petersburg, representatives of the Central Asian ethnic groups (Uzbeks and Tajiks), as well as Moldovans, have the most uneven settlement pattern. In more than 20% of the municipalities, the concentration of representatives of these ethnic groups, according to the official data, differs from the city average by more than a factor of 5. Whereas the highest C_{el} values are observed in the northern districts of the city (Kurortnyi, Primorskii, Vyborgskii), in the southern districts (Petrodvorets, Krasnoe Selo, Kirovskii, Kolpino), the share of almost all ethnic communities of St. Petersburg is minimal.

(4) The spatial characteristics of the settlement pattern of the most numerous ethnic communities makes it possible to state significant differences in their location. Immigrants from Central Asia (Uzbeks, Tajiks) represented in St. Petersburg mainly by temporary labor migrants, live fair compactly in the same areas of the city. The main ethnic groups of the European republics of the former USSR (Ukrainians, Belarusians, and Moldovans), also having in their structure a significant number of guest workers, are characterized by a somewhat smaller coincidence of places of residence throughout St. Petersburg. For the ethnic groups of the South Caucasus (Armenians, Georgians, and Azerbaijanis), Tatars, and Jews, the correlation with other ethnic groups in the choice of residence in St. Petersburg is weak (less than 0.5) or absent.

Analysis of settlement patterns of the most numerous ethnic communities on the territory of St. Petersburg makes it possible to suggest the beginning of a spontaneous ethnic segregation process. Compared with major European and North American megalopolises, the localization and spatial concentration of ethnic groups in St. Petersburg are at a low level. Unlike Paris, London, or New York, there are no such areas with the predominance of a particular ethnic community in St. Petersburg. However, it is very probable that ethnic enclaves will form in the city in the nearest

future. A review of the causes and consequences of this process is beyond the scope of our study, but, of course, is important for organizing the vital aspects of urban society.

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