



## Article

# Changes in the Spatial Development of a Satellite Town under the Impact of a Metropolitan City—Evidence from Pruszcz Gdański (Poland)

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**Abstract:** Nowadays, large cities are becoming troublesome to live in in many respects. Due to the high prices of real estate, they are not attractive to young people. The literature often presents analyses of the phenomenon of urban sprawl to suburbia, but the subject of the impact of a metropolitan city on the functioning and changes in spatial development of satellite towns is rarely discussed. This study attempts to describe and to determine factors conducive to this process by identifying, through participant observation, the potential phenomenon of the influence of Gdańsk as a city with metropolitan functions on Pruszcz Gdański, a town directly adjacent to it. The article uses two main groups of methods: (a) a comparative analysis of orthophotomaps from 2005–2020 which allowed for recreating the dynamics of housing development, supported by land mapping as part of field research; (b) a structured internet survey on a sample of 393 residents which allowed identifying the factors influencing the spatial development of Pruszcz Gdański and the perception of this phenomenon, as well as an in-depth interview with a group of 6 residents which allowed obtaining detailed information on the quality of life in Pruszcz Gdański and the factors that determine living in this town. The proximity of both cities and much lower real estate prices in Pruszcz Gdański, which still has most of the functions of an independent town, is beneficial to settling down of migrants from the core of the metropolis. This process particularly applies to young people of working age who cannot afford to buy a new flat in Gdańsk. Building new multi-family housing estates close to the border with Gdańsk has created a kind of new service band or, in a sense, a “town within a town”.

**Keywords:** satellite town; metropolis; Gdańsk; new center; urbanisation; migrations



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## 1. Introduction

The development of metropolitan cities as regional centers of concentration of employment, science, and multidimensional development usually leads to significant increases in the population. The ensuing process of migration leads to an increasing value of demand for real estate and, consequently, to an increase in its prices. Metropolises are cities that are also characterized by a deteriorating quality of life, e.g., due to congestion, environmental quality, noise, and light pollution [1,2]. All these factors lead to the phenomenon of urban sprawl well described in the scientific literature [3–6]. Young people who enter adult life after graduation and who want to become independent are unable to support themselves with the costs of living typical of a metropolitan city [1]. Usually, they do not have funds to finance the purchase of a flat or a house, which in such a city are much more expensive than in suburbs [7]. When looking for real estate purchase opportunities, they often choose surroundings of an agglomeration, e.g., satellite town, where the cost of living is lower [8]. Living in close proximity to a metropolis with a good labor market is a good alternative.

The urban sprawl phenomenon is characteristic of various parts of the world, but it accompanies developing countries in a special way. Over the past 30 years, it has been particularly visible in Central and Eastern Europe [9–11]. It affected both metropolitan

areas and smaller towns. The effect of these activities related to migration to the suburbs were problems related to the maladjustment of infrastructure, in particular transport, road connections, and public transport. Inhabitants moving to the suburbs want to improve their living conditions (both understood as the size of the flat/house and environmental issues). On the other hand, they expect the city in which they usually continue to live their lives (work, study, shop, send their children to schools, use restaurants or theaters) to provide access from the suburbs. It is a vicious circle of suburbanization. It has had a particularly strong dimension in the mentioned countries of Central and Eastern Europe, because on the one hand the real estate market was liberalized, more residents had the opportunity to buy apartments or build houses, but these countries entered serious budget problems after the period of political transformation [12–17]. The lack of sufficiently high financial resources did not allow for the implementation of all necessary investments, even the most necessary ones. As a result, living in the suburbs was not easy at all. Along with the increase in the motorization index, which is also typical for post-communist countries, congestion increased and the cost of living in the suburbs increased [18,19]. Nowadays, the situation in the post-communist countries of the European Union is blurring because many investments are financed from Community funds, and moreover, the countries of Central and Eastern Europe have been dynamically developing over the last 15–20 years [12]. The process of suburbanization entails many problems related to a need to ensure integrated and well-functioning transport. Otherwise, it leads to a deterioration in the quality of life. However, there are situations different from the classic urban sprawl, when near the metropolis there is a smaller town with its own functions and, simultaneously, a transport system shaped for decades. Such a situation is exemplified by the spatial relationship between Gdańsk and Pruszcz Gdański in the northern part of Poland [20–23]. Pruszcz Gdański has developed since the Middle Ages. After World War I, it became part of the Free City of Gdańsk. There is no information on the date of obtaining city rights, but it has been included in the official list of cities since 1945 [24]. Due to the neighboring location of both cities and transport connections (road and rail transport), Pruszcz Gdański is a good alternative for people who want to live in a town offering cheaper real estate, a slower lifestyle, and at the same time enabling daily commuting to places of work or education in Gdańsk.

1. By identifying the growing dynamics of migration to Pruszcz Gdański, expressed in the number of inhabitants and new single-family and multi-family housing buildings, as well as the density of buildings in the north-western part of the city, an attempt was made to investigate and verify the factors influencing these processes [25]. On this basis, research questions were formulated: Is Pruszcz Gdański an independent town fulfilling all typical functions, or does it rather have the features of a satellite town?
2. How strongly does the metropolitan city of Gdańsk influence the functional and spatial structure of the town of Pruszcz Gdański?
3. Is there a phenomenon of migration from Gdańsk to Pruszcz Gdański and what are the possible factors of this phenomenon?
4. What is the perception of the inhabitants of Pruszcz Gdański of changes in the spatial development of the town?
5. Does the influence of the proximity of Gdańsk affect the spatial stratification of Pruszcz Gdański (the formation of a sub-center)?

## 2. Materials and Methods

In order to study the phenomenon of the influence of the metropolitan city of Gdańsk on a satellite town of Pruszcz Gdański, a research procedure involving several steps and the ensuing objectives was prepared. The main author of the study, living in Pruszcz Gdański since birth, has identified a phenomenon of dynamic densification of housing development and a high value of migration from Gdańsk in the last several years. Based on this observation, literature studies were conducted using the desk research method. They showed that this process is not well recognized, in particular in the context of

Polish cities. Then, cartographic materials (orthophotos) as well as planning and strategic documents of the municipality of Pruszcz Gdański were collected [26–28]. The temporal and spatial expansion of the building development in Pruszcz Gdański was analyzed based on comparisons of available orthophotomaps from 2005, 2011, 2017 and 2020, and it was additionally verified by field mapping. On this basis, original maps illustrating the concentration of housing, services and workplaces were drawn. As a result of this analysis, it was possible to identify zones of housing densification and of the formation of a new service band along new housing estates.

In order to broaden the knowledge of the factors determining migration to Pruszcz Gdański, a questionnaire was designed, which was distributed by online portals. A total of 393 responses were obtained from residents. Although the survey was not representative, the high number of respondents allowed drawing important conclusions. In the next step, 6 inhabitants of different age and social status were selected using the snowball method, with whom in-depth telephone interviews were conducted. Owing to the online survey and telephone interviews, it was possible to identify:

- Factors conducive to settling down in Pruszcz Gdański,
- Assessment of the quality of life,
- Perception of changes in spatial development,
- Perception of the formation of a new service band in the north-west of the town.

In order to verify this hypothesis, advertisements for the sale of real estate in Pruszcz Gdański and selected districts of Gdańsk with various statuses were collected, as of December 2020, from the most popular local and national real estate portals. On this basis, the mean price of 1 m<sup>2</sup> was calculated for flats, single-family houses, commercial premises and building plots. Assuming that a large number of offers allows limiting the influence of factors related to the location, standard, size and neighborhood of the property, comparable values were obtained.

### 3. Scientific Background

#### 3.1. Literature Review

Satellite towns exist around most metropolitan cities and are connected with them through the functions that they perform on their behalf. Mainly, this concerns housing issues. With increasing population density in metropolitan areas, the quality of life deteriorates, and the prices of real estate and costs of daily living rise. Thus, the phenomenon of suburbanization—living in the suburbs—appears [29–34]. Both in highly developed and in developing countries, it is a normal process which nevertheless leads to a number of consequences. The main one is an increase in traffic intensity, as inhabitants migrating to the suburbs usually remain in daily relations with places of work and education in the agglomeration core [35,36]. Urban sprawl is not without negative consequences for the natural environment either, in particular in rural areas [37–39]. The dynamic process of building densification in the suburban area is usually not supported by previously prepared development plans. As a result, a typically urban tissue is created, not matching the surroundings and degrading the resources on which it grew [38–41].

The situation is slightly different in the case of satellite towns that developed their own functions before being subject to the migration process [42,43]. Then, however, there is a threat of “snatching” some of the suburbs for the benefit of the metropolis. This can take place both administratively (changes in borders) and informally (the inhabitants’ socio-economic ties). People who move because they desire to have a larger flat or a house, of a better standard for a similar price, or those who cannot afford any flat in a metropolitan city, usually remain tied by study or work with the agglomeration [44–46]. Then function daily between the metropolis and the place of residence. Basic shopping is done, or services are used on the way, and people do not use them in the place of residence [47,48]. Combining residential and service functions, as in the analyzed case, when a sub-center is being developed—a new service band, may be an exception. However, a new context emerges then—the breaking down of the satellite town being an indirect effect of the influence of

the metropolitan city. The creation of an area that fully satisfies the residents' needs leads to degradation of the traditional city center with service functions. Consequently, the central service band may be redefined, and the shopping and service center may be moved to a new place defined by the inhabitants' daily life.

In Poland, research on the process of suburbanization and urban sprawl is relatively well described in the literature on the subject. These issues are one of the most important issues that have attracted interest among city researchers in recent years. The main topics include:

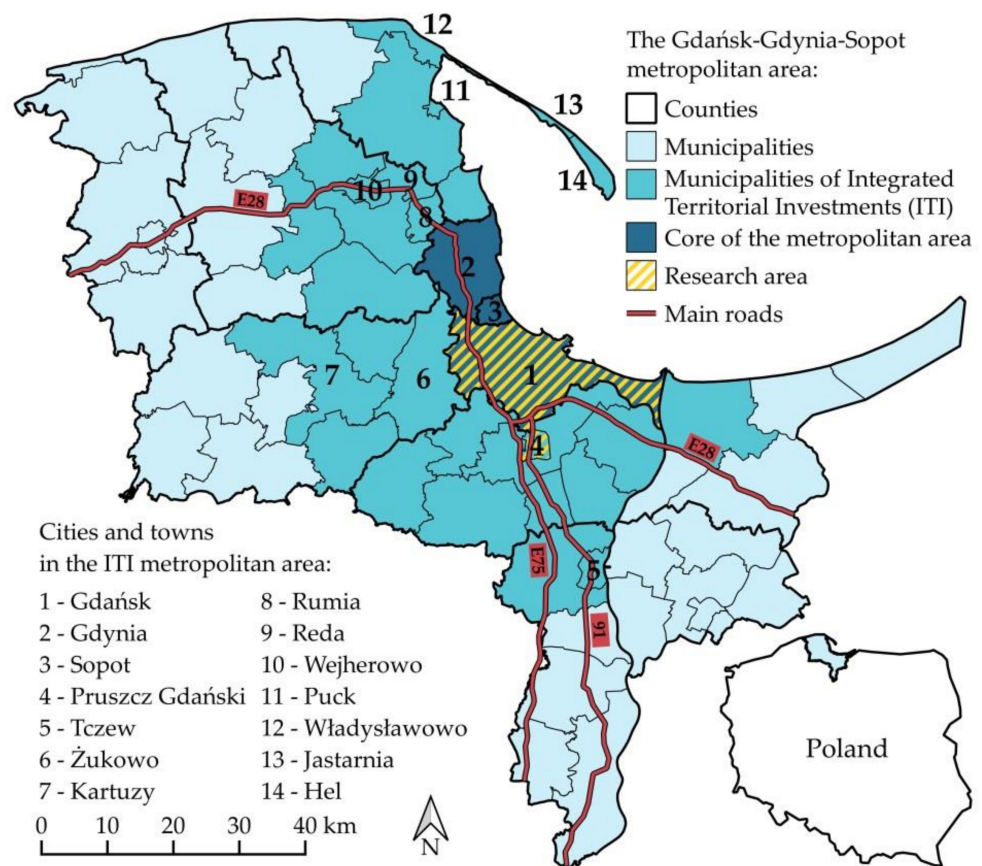
1. The intensity of urban sprawl [12],
2. The impact of suburbanization on the town morphology [38,49],
3. Demographic changes in towns and villages as a result of suburbanization [50–53],
4. The impact of suburbanization on the finances of towns (especially villages) where new residents settle [54–56],
5. The impact of the location of industrial activities on suburbanization and urban sprawl [57],
6. Suburbanization as a threat to sustainable development [31,58],
7. Residential suburbanization [59],
8. Research on towns of various sizes subject to the process of suburbanization, large [20,21,32,36], medium [60], and small [22], the impact of the emergence of shopping centers in the suburbs on changes in the structure of the suburbs [61–63].

The presented phenomena are not sufficiently researched and described in the literature on the subject. While the process of suburbanization and urban sprawl is often undertaken by researchers, an assessment of the scale of an impact of a metropolitan city on its satellite towns in terms of directions of spatial development is not a frequent subject of scientific studies [64–66]. The context of a post-communist country in which suburbanization processes have only been taking place for about 30 years is also of additional value.

### 3.2. *Characteristic of the Gdańsk Metropolis*

The Gdańsk Metropolitan Area, also known as the Tricity agglomeration or the Gdańsk agglomeration [66], is located in the northern part of Poland on Gdańsk Bay on the Baltic Sea coast (Figure 1). The central part of the metropolis is formed by so-called Tricity, three organically connected cities—Gdańsk, Sopot, and Gdynia, with a total population of 753,111 inhabitants (2020) [67]. Depending on the delimitation method, it is assumed that the metropolitan area is inhabited by from 1 to 1.5 million inhabitants in the area of from 2,100 km<sup>2</sup> up to over 3,700 km<sup>2</sup> [68–70]. In municipalities located close to the core of the metropolitan area, urbanization processes are the strongest, therefore, they cooperate within the framework of Integrated Territorial Investments, which is to facilitate investments in the functional area. Apart from the three mentioned cities, the agglomeration also includes Tczew, Pruszcz Gdański, Kartuzy, Żukowo, Rumia, Reda, Wejherowo, Puck, Władysławowo, Jastarnia, and Hel (Figure 1). Except for the agglomeration core created by so-called Tricity, other towns should be considered as satellite centers (Figure 1). Their population does not exceed 60,000 residents.

Gdańsk is the most important city of Pomerania and at the same time the capital of the Pomeranian Voivodeship. It integrates most of the metropolitan functions, although together with Gdynia and Sopot it forms a practically indivisible city with difficult to grasp borders. The phenomenon of suburbanization is developing around Tricity, both to the north around Gdynia and to the south around Gdańsk. Pruszcz Gdański is one of the towns that are directly adjacent to Gdańsk, and it is undergoing the process of suburbanization [71].



**Figure 1.** Location of the research area (source: own elaboration).

### 3.3. Case Study—Pruszcz Gdański, a Satellite Town

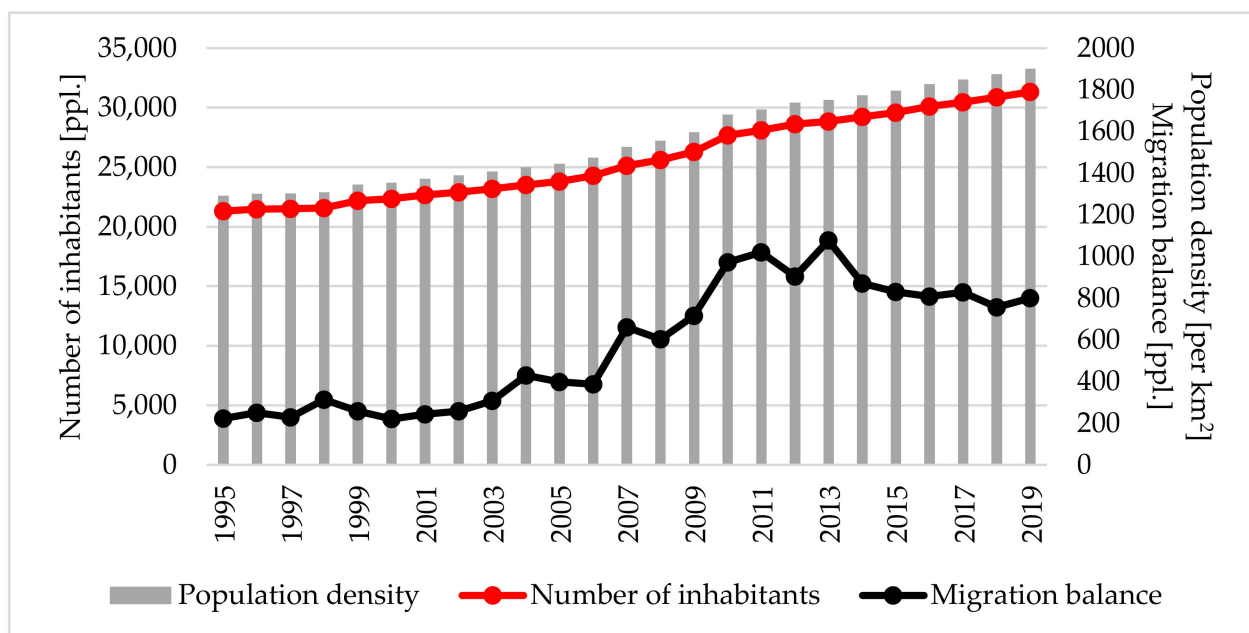
Pruszcz Gdański is located in the Pomeranian Voivodeship; it has borders with Gdańsk from the north and with rural municipalities from the other sides. It obtained rights of an independent town in 1945 [72]. The city of Pruszcz Gdański is the seat of municipal, commune and powiat authorities.

The town area covers 16.5 km<sup>2</sup>. As of December 31, 2019, Pruszcz Gdański had 31,326 inhabitants with a population density of 1,902 people/km<sup>2</sup> [65]. The town is an important transport hub, located between three road routes of national and international importance. National road No. 91 runs through the area of Pruszcz Gdański, and nearby to the west there is highway A1, which is part of the European route E75. To the north, Pruszcz Gdański is also connected to expressway S7, which is part of the E28 and E77 European corridors. One of the main Polish railway lines towards Warsaw also runs through the town. Both the railway line and road routes have ensured linear spatial development of the town in the north-south system.

Pruszcz Gdański is a relatively small town with its fastest development occurring in the 19th century, the period of industrial revolution [73]. Industrial plants that were established at that time, in particular a sugar factory located in the city center, guaranteed stable employment for the inhabitants of Pruszcz Gdański and the surrounding villages. The town's spatial development followed the main north-south road, along which town houses were built [74]. The buildings erected at the turn of the 19th and 20th centuries have remained to this day, but it should be emphasized that the transit location of the town resulted in the lack of a traditional city center, which was artificially created only at the beginning of the 21st century [75].

Since the beginning of the 21st century, dynamic spatial development of the town has been taking place again, which is related to the migration to Pruszcz Gdański from nearby villages and from Tricity, in particular from Gdańsk [30,76,77]. New housing investments

are being built mainly in the north-western part, close to the routes connecting them with the Tricity ring road and national road No. 91. Figure 2 shows the increase in the total number of inhabitants as well as the change in population density and the total migration balance in the years 1995–2019.



**Figure 2.** Dynamics of the demographic indicators of Pruszcz Gdański in the period 1995–2019 (source: own elaboration based on BDL [67] and Municipal Office of Pruszcz Gdański [26,27]).

The presented data show that in 25 years the population of Pruszcz Gdański increased by almost 47% from over 21,000 to over 31,000. The population density also changed with the value growing from less than 1300 people/km<sup>2</sup> up to 1900 people/km<sup>2</sup>. The positive migration balance fluctuated in the analyzed period, with peaks in 2010–2013, and it remains high at around 800 people per year. Strategia Rozwoju Miasta Pruszcz Gdański 2020–2030 [Eng.: The Development Strategy of the Town of Pruszcz Gdański 2020–2030] forecasts a further increase in the number of inhabitants to 35,000 in 2030 as a result of a positive birth rate and net migration [26].

The town's spatial policy notices the ongoing urbanization processes and tries to respond to the growing demand for investment areas, including housing. The authorities of Pruszcz Gdański see the success of their development primarily in an attractive location in relation to Gdańsk and the expansion of infrastructure enabling a further increase in the number of inhabitants. The documents responsible for the spatial development of the town did not express any concerns about the growing residential function and the change of the town's character. On the other hand, expansion of buildings into undeveloped areas and extension of service functions in order to provide jobs for the local community are planned [26–28].

The migration of people to Pruszcz Gdański and their settling down mainly in the north-western part of the town resulted in changes in spatial development. The existing buildings in the town were typical of smaller towns. Single-family or terraced houses with a small number of stories dominated. The few multi-family blocks were exceptions. The newly formed residential district, which has been developing since the beginning of the 21st century in the north-western part of the town, has a different character. According to the Local Development Plans (MPZP) [28], the area is intended for high-intensity residential and service development. The area covers less than 38.5 hectares. According to the Local Development Plan, the buildings will be 6–14 m high. In the area, buildings with service facilities with a height of 6–11 m are also allowed. The provisions of the local development

plan have resulted in significant densification of buildings and an increase in the population density, which differentiates this area from the rest of the town. Allowing service facilities to open on ground floors of residential buildings and in their immediate vicinity has influenced the development of services and de facto met the needs of residents in this area. This is of key importance for the town's functioning, as it affects its inhabitants' mobility. In the scale of the entire town, it is the most important area of the planned concentration of multi-family housing development with services. In turn, the development areas of single-family housing are planned mainly in the northern and north-western part of the town. The common feature of the designated development areas is their location near the border with Gdańsk. Thus, the direction of the town's development is clearly defined through the prism of the expected immigration process [27,28].

A certain picture of the town's functioning is presented in Strategia Rozwoju Gminy Pruszcz Gdański na lata 2020–2030 [Eng.: The Development Strategy of the Municipality of Pruszcz Gdański for 2020–2030] [26]. During its preparation, a survey was conducted among 501 residents and 22 entrepreneurs who assessed the strengths and weaknesses of the town. Among the strengths of Pruszcz Gdański, the proximity of the Tricity labor market is the most important feature of the town. As many as 87% of the respondents indicated this feature. A large number of companies (35%) and a large number of investment areas (34%) were indicated less frequently. As regards social infrastructure, 56% of the inhabitants indicated the constantly developing housing infrastructure as the greatest strength. Almost half of the respondents (48%) also indicated good access to education. Entrepreneurs indicated the proximity of Tricity as the town's most important strength (77% of responses). The remaining answers were indicated much less frequently (up to 20%). The descriptive part of the Strategy emphasises that the growing number of inhabitants may lead to overcrowding in schools. Although the residents appreciate lower property prices in Pruszcz Gdański than in Tricity, the Strategy shows it's still high prices both on the primary and secondary market as the town's weakness [26]. Probably this issue was considered in the long-term perspective, and the increasing demand for property in Pruszcz Gdański contributed to an increase in their prices. To sum up, Pruszcz Gdański is inextricably linked with Gdańsk and, more broadly, with the Tricity agglomeration. The proximity of Gdańsk, its education and labor market is the most important factor shaping the town's contemporary and future development.

#### 4. Results

##### 4.1. Determinants of Migration to Pruszcz Gdański

Population migration to Pruszcz Gdański and intensification of multi-family and single-family housing development were identified through participant observation and statistical data analysis [65]. They prove the existence of factors that affect making such decisions among settlers. One of the reasons for moving may be the lower price of real estate than in Tricity, in particular in adjacent Gdańsk (Table 1). Owing to lower prices, flats can be bought by younger people, those with lower income and those who want to have flats of a larger size or a better standard [76–79].

**Table 1.** Comparison of average real estate prices in Pruszcz Gdańsk and Gdańsk. Price per 1 m<sup>2</sup>. (December 2020, 1 PLN = 0.227 EUR, source: own elaboration based on [76–79]).

	Property Type	Pruszcz Gdanski	Gdańsk—Chełm	Gdańsk—Jelitkowo	Gdańsk—Wrzeszcz	Gdańsk—Śródmieście
PLN/m <sup>2</sup>	Flats from the primary market	6407	6552	17,755	11,926	15,161
	Flats from the secondary market	6553	8092	19,599	10,698	13,278
	Houses from the secondary market	4027	5294	17,446	7208	5792
	Commercial premises	4675	4629	18,500	8576	14,966
	Building plots	288	377	-	2479	-

Real estate prices in Pruszcz Gdański are lower than in Gdańsk. For comparison, several districts with different living standards were selected. Property prices were compared for the following districts:

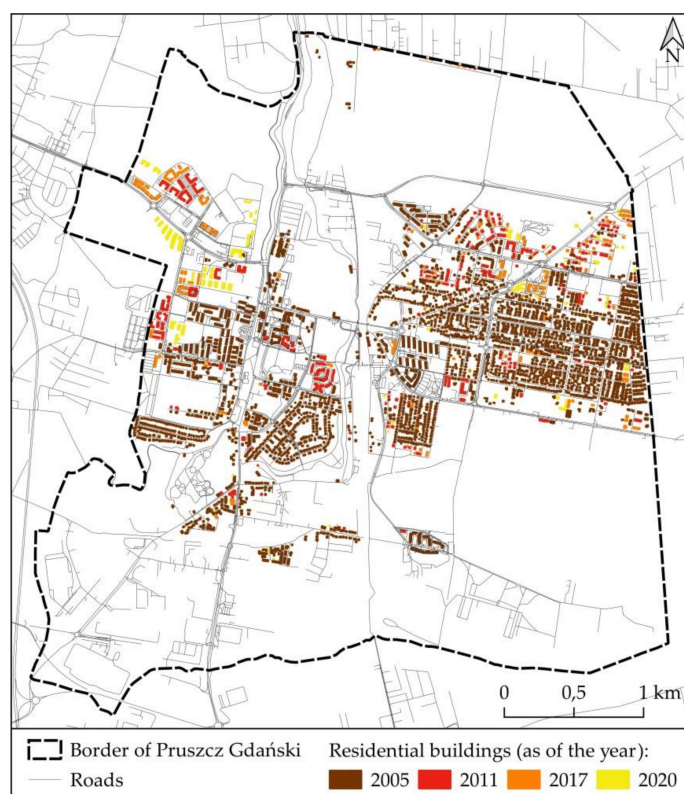
- Chełm—close to Pruszcz Gdański, a typical residential district (dormitory district),
- Jelitkowo—a district with a seaside location, considered prestigious, with new high-standard housing estates,
- Wrzeszcz—a residential and service district located in the Central Service Zone,
- Śródmieście—a residential and service district located in the city center, in the Central Service Zone, with significant historic buildings.

Real estate prices in all districts of Gdańsk were higher than in Pruszcz Gdański. Only the prices of flats from the primary market and commercial premises in Chełm district were comparable. The remaining districts were characterised by much higher real estate prices, which has a decisive impact on the decisions to purchase property by the metropolis inhabitants.

#### 4.2. Change in Spatial Development

##### 4.2.1. Concentration of Housing Development

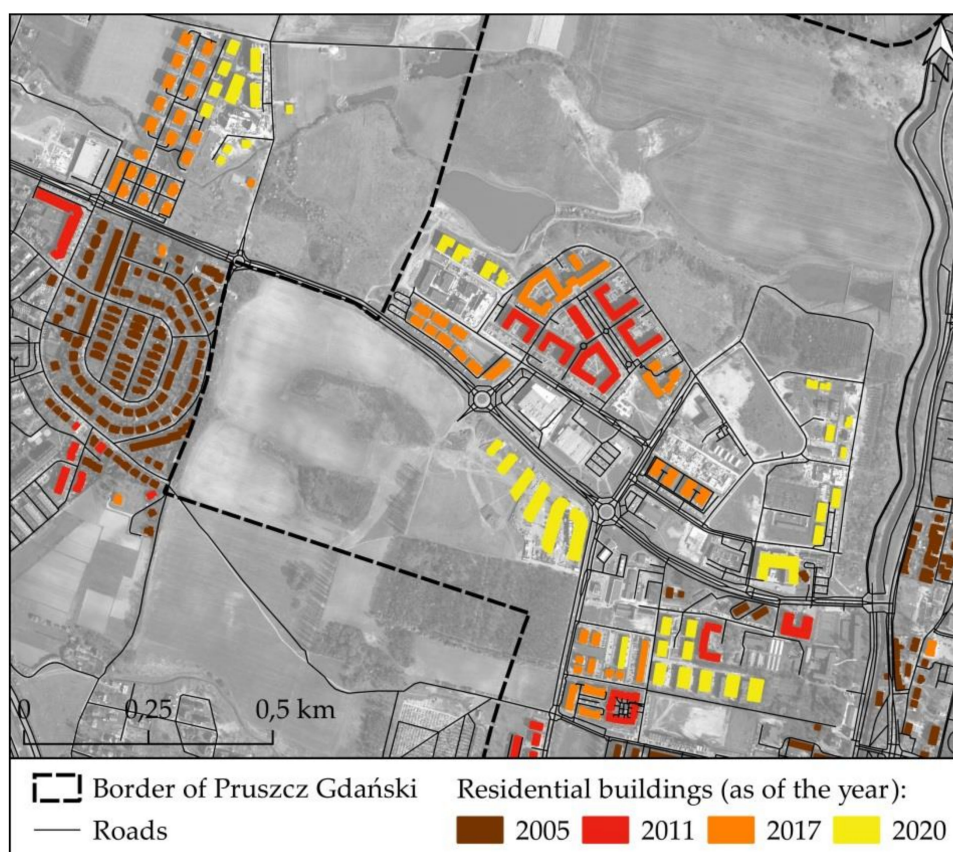
The buildings under construction illustrate the changing spatial development of the town. As part of the research procedure, the building development was reconstructed based on a comparative analysis of orthophotomaps from 2005–2020. Figure 3 shows the periods of building development in Pruszcz Gdański. The analysis allows distinguishing two areas of concentration of new buildings in the last 15 years. These are multi-family residential buildings located in the north-western part of the town, as well as single-family houses located in its north-eastern part [30]. The map also shows the difference in the periods of constructing the buildings. In the eastern part of the town, single-family houses were mainly built in 2005–2017, and in the western part, multi-family houses were built in 2011–2020.



**Figure 3.** Changes in the housing development in the town of Pruszcz Gdański in 2005–2020 (source: own elaboration based on [27,28]).



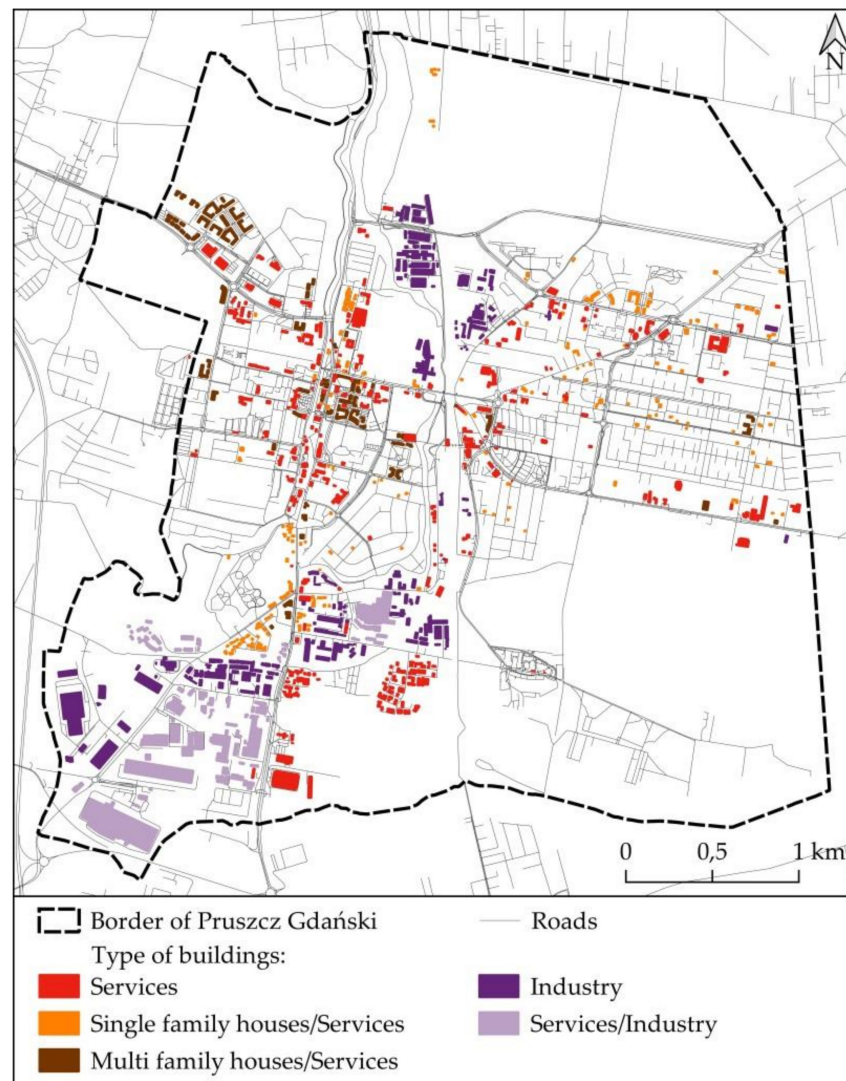
Another issue is the increase in multi-family housing directly outside the north-western border of Pruszcz Gdański (Figure 4). The influence of the metropolitan core affects changes in the development of the neighboring areas, regardless of the administrative division. The process of densification of buildings is functional in nature and concentrates in locations with features conducive to the development of a given function. In this way, the area of intense changes in the built-up tissue goes beyond the boundaries of the analyzed satellite town. In addition, the development of services accompanying the newly built housing estates improved the quality of life of their inhabitants and, as a result, determined the creation of new estates.



**Figure 4.** Changes in housing development in the area of Pruszcz Gdański with the highest development dynamics in 2005–2020 and in adjacent areas (source: own elaboration based on [27,28]).

#### 4.2.2. Concentration of Jobs in Industry and Services

The high dynamics of the increase in the number of inhabitants, including people of working age, may provide a base for workplaces located or planned in Pruszcz Gdański. 63% of the inhabitants are of working age, and only 16.2% are beyond retirement age [67]. The most important employment zone is situated in the south-western part of the town, where warehouses and industrial plants are located (Figure 5). This area is included in the Pomeranian Special Economic Zone and the Baltic Investment Zone [80,81]. The main entities that have their headquarters here include LPP SA (clothing industry), Poczta Polska (Polish Post Office—distribution center, Figure 6), LIDL (food sector, distribution center), Crown Packaging Polska Sp. z o. o. (production of packaging), Assel—Electronics Manufacturing Poland (production of electronics).



**Figure 5.** Industrial buildings and service development in Pruszcz Gdański by type in 2020 (source: own elaboration based on [27,28]).



**Figure 6.** Warehouses of the LPP S.A. clothing company in Pruszcz Gdański (photo taken by A. Świątkiewicz).

Along with the political transformation of Poland in 1989, the structure and landscape of services also changed. Since the mid-1990s, chain shops with international capital have begun to appear, especially large-format retail chains—supermarkets and hypermarkets. The dynamics of changes increased with the accession of Poland to the European Union in 2004. Its consequence was the transformation of the spatial structure and trade, also in

Pruszcz Gdański [82]. On the one hand, large retail outlets appeared; on the other hand, consumer tastes also changed, which influenced the nature of the main streets and central zones, traditionally associated with trade.

Pruszcz Gdański has an extensive offer of services. The analysis illustrated in Figure 5 shows that it is spatially adjusted to the town's development directions. The development of multi-family housing was conducive to the emergence of services. In particular, adequate demand generated interest in discount chains and large-format grocery shops. In the north-western part of the town, large-format shops have been opened in recent years, redefining the central service band. Parallel development along the street where new estates with multi-family buildings are being built have shaped the service area. In the newly constructed housing estates, services located on the lowest floors of buildings are also characteristic. A large concentration of small services and large-format shops increases the dynamics of entrepreneurs' "leaving" the traditional trading center.

#### *4.3. Residents' Opinions of Changes in Spatial Development*

In addition to a qualitative analysis of planning and strategic documents regarding the spatial development of the municipality of Pruszcz Gdański, a survey among residents was conducted as well as in-depth interviews with a selected group of respondents. Due to the coronavirus pandemic, the survey was conducted online using a questionnaire developed in Microsoft Forms. It was completed by almost 400 persons living in the municipality of Pruszcz Gdański ( $n = 393$ ). Of the respondents, 71.2% were female and 28.8% male. The greatest number of answers was provided by people aged 30–45 (43.3%). Slightly fewer respondents came from the 18–29 age group (37.9%). The remaining age groups comprised much smaller numbers of respondents. For people aged 46–59, it was 9.2%, and for people aged 60 and over—4.1%. The questionnaire could also be completed by younger persons aged 16–18 (5.6%). The online survey does not meet the proportionality criteria, but due to the large number of obtained responses, it should be considered as a source of certain valuable information. A significant number of respondents aged 16–45 (86.8%) reflects popularity of the Internet among young and middle-aged people.

The survey consisted of 11 questions, 9 of which were single-choice and 2 multiple-choice ones. Among the respondents, 73.5% lived in the town of Pruszcz Gdański, and 22% in the rural commune of Pruszcz Gdański. 4% of people lived in the vicinity of the commune. The value of the obtained information lies in the large share of people who have lived there for over 10 years—65.1%. 14.5% were people living for 5 to 10 years, and slightly more than 15% for 1 to 5 years. The respondents mainly lived in multi-family blocks (59.8%). The remaining responses concerned detached single-family houses (25%), semi-detached houses (11.5%), and single-family terraced houses (3.6%). Almost 54% of the respondents moved to Pruszcz Gdański from another town (Figure 7). Those who answered that question in the affirmative were required to answer two additional questions. These concerned a previously inhabited city. Moreover, 61.6% of respondents indicated Tricity, 20.9% had lived in a town smaller than Pruszcz Gdański, and 17.5% in a larger town but different from Tricity. The most frequently quoted reasons for moving included: (i) leaving the family home—32.2%, (ii) lower real estate prices than in the previously inhabited place—28.9%, (iii) willingness to change the environment—22.3%. The remaining responses concerned the willingness to live in a larger flat or house than the previously occupied one, moving from a flat into a house, starting a family, wanting to live in a smaller (quieter) town or return to the hometown.

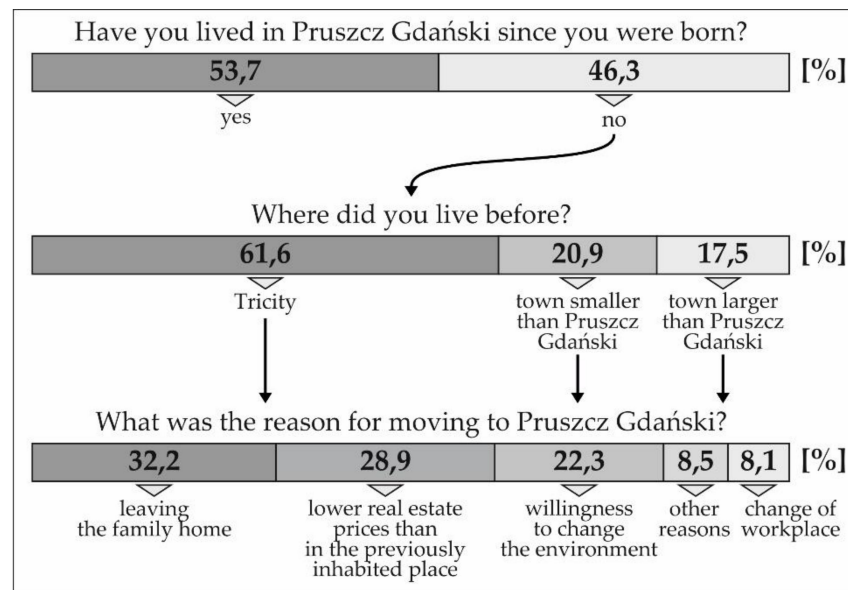


Figure 7. Answers given in the survey among residents (source: own elaboration).

The next question concerned the workplace. More than half of the inhabitants (54%) commute to Tricity, 34% work in Pruszcz Gdański, and less than 12% work in another town. In terms of the use of services, 73% of the respondents indicated those located in Pruszcz Gdański, and 25% went to Tricity. The respondents were also asked to indicate the distinguishing features of Pruszcz Gdański (Figure 8). The convenient location proved to be the greatest advantage of the town (70.2%). The dynamic development of the town (59.5%), safety (42%), public spaces and green areas (39.7%) as well as places for recreation and sports (25.4%) were also distinguished. There were also other, less numerous answers, such as the ease of dealing with administrative matters, free public transport, etc.

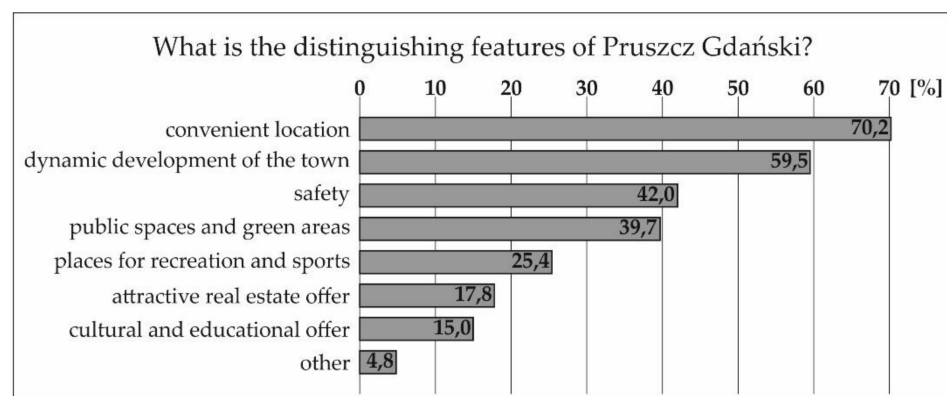


Figure 8. Answers given in the survey among residents (source: own elaboration).

Another aspect raised in the survey was the change in the spatial development of the town. The respondents were asked about changes in the character of the dominant development from single-family to multi-family buildings. As many as 75.8% of the people noticed these changes, while only 4.8% of the residents were of the opposite opinion. Slightly over 19% did not have an opinion on this matter. The question of moving the range of services from the town center to the north-western part was important from the point of view of the research subject. Over 80% of the inhabitants took note of this fact, 10.7% denied it and 8.7% did not have an opinion.

The survey indicated certain dependence that confirm the directions and dynamics of the spatial development of Pruszcz Gdański. The town was the relocation destination

mainly from Tricity, and the factor that influenced this process was the lower price of property, which also allowed people to live in a larger house or flat. However, Pruszcz Gdański is a dormitory town for Tricity, in particular for Gdańsk, because most of the respondents commute to work outside of Pruszcz Gdański. The residents also notice the changing nature of the buildings and the directions of development—the shifting of the service band from the traditional center towards the north-western part of the town.

#### 4.4. Study of the Factors of Residents' Migration to Pruszcz Gdański

In order to identify the factors influencing the decision to move to Pruszcz Gdański, six respondents were selected using the snowball method, with whom in-depth interviews were conducted by phone. Each of the interviewees moved from a different town. The interview was structured and consisted of the same 13 open-ended questions, additionally expanded depending on the nature of answers. Table 2 presents a summary of the interviews in the form of aggregated responses to groups of topics.

**Table 2.** Answers given in the in-depth interview (source: own elaboration).

	Respondent 1. (37-year-old Woman)	Respondents 2 and 3 (Married couple, 37-year-old Woman and 43-year-old Man)	Respondent 4 (45-year-old Man)	Respondent 5 (21-year-old Woman)	Respondent 6 (25-year-old Woman)
Groups of Thematic Issues	<ul style="list-style-type: none"> <li>- previously lived in Gdańsk</li> <li>- 3.5 years in Pruszcz Gdański</li> <li>- lives in a multi-family block in the northern part of the town</li> </ul>	<ul style="list-style-type: none"> <li>- the man has lived in Pruszcz Gdański since birth, and the woman moved after starting a family, previously living in Gdańsk</li> <li>- live in a single-family house</li> </ul>	<ul style="list-style-type: none"> <li>- he has lived in Pruszcz Gdański since birth, then briefly in Gdańsk and returned to Pruszcz Gdański buying his own flat</li> <li>- lives in a multi-family block in the eastern part of the town</li> </ul>	<ul style="list-style-type: none"> <li>- she moved to Pruszcz Gdański when she was still a small child, so it was her parents' decision</li> <li>- has lived for 10 years in a multi-family building in the so-called new part of Pruszcz Gdański</li> <li>- previously lived in Gdańsk</li> </ul>	<ul style="list-style-type: none"> <li>- she moved to Pruszcz Gdański when she was still a child, so it was her parents' decision</li> <li>- has lived in Pruszcz Gdański for 10 years</li> <li>- previously lived in Gdańsk</li> </ul>
1. Reasons for living in Pruszcz Gdański	<ul style="list-style-type: none"> <li>- low real estate prices</li> <li>- the possibility of buying a larger flat of a better standard</li> </ul>	<ul style="list-style-type: none"> <li>- due to the possibility of building a house</li> <li>- family and friends living there</li> </ul>	<ul style="list-style-type: none"> <li>- lower real estate prices</li> <li>- lower costs of living</li> </ul>	<ul style="list-style-type: none"> <li>- due to the possibility of buying a larger flat</li> </ul>	<ul style="list-style-type: none"> <li>- decision to buy a larger flat</li> <li>- in fact, for the planned amount, it was possible to buy a large single-family house</li> </ul>
2. Place of Work or Study	- in Gdańsk	- in Gdańsk	- in Gdańsk	- in Gdańsk and Sopot	- in Gdańsk
3. Place of Use of Services	<ul style="list-style-type: none"> <li>- practically only in Pruszcz Gdański, because all the necessary services are available</li> </ul>	<ul style="list-style-type: none"> <li>- only in Pruszcz Gdański, because they do not like going to Gdańsk, where it is "crowded"</li> </ul>	<ul style="list-style-type: none"> <li>- mainly in Pruszcz Gdański</li> </ul>	<ul style="list-style-type: none"> <li>- uses basic services in Pruszcz Gdański, and others in Gdańsk</li> <li>- notes that the supply of services (e.g. shops typical of shopping malls) is limited</li> <li>- no cinema</li> </ul>	<ul style="list-style-type: none"> <li>- buys basic food products in Pruszcz Gdański, and goes to Gdańsk to buy the rest</li> </ul>

Table 2. Cont.

4. Ways of Traveling	<ul style="list-style-type: none"> <li>- only by car, but appreciates the existence of free public transport in Pruszcz Gdański</li> <li>- also uses a private bicycle</li> </ul>	<ul style="list-style-type: none"> <li>- only passenger cars</li> </ul>	<ul style="list-style-type: none"> <li>- mainly by public transport</li> <li>- notes a problem in the lack of extension of the fast urban railway to Pruszcz Gdański</li> </ul>	<ul style="list-style-type: none"> <li>- mainly by public transport</li> <li>- notes that commuting to Gdańsk and Sopot is not burdensome at present, although it used to be</li> </ul>	<ul style="list-style-type: none"> <li>- only by public transport</li> </ul>
5. Directions of Spatial Development	<ul style="list-style-type: none"> <li>- lives in the vicinity of the new service center in Pruszcz Gdański and uses only it; does not frequent the traditional center along the main artery of the city</li> </ul>	<ul style="list-style-type: none"> <li>- they do not visit the traditional city center; they only use services in the newly formed service band</li> <li>- they notice changes in the character of the development into multi-family one</li> </ul>	<ul style="list-style-type: none"> <li>- notices the increasing number of multi-family buildings and the development of services in the north-western part of the town</li> </ul>	<ul style="list-style-type: none"> <li>- notices that mainly multi-family buildings are being built and she heard “that the second center of Pruszcz is being built in her estate”</li> </ul>	<ul style="list-style-type: none"> <li>- observes the changes in land development and the dynamics of changes in the northern part of Pruszcz Gdański</li> <li>- does not use services in the traditional town center</li> </ul>
6. Distinguishing Features of Pruszcz Gdański	<ul style="list-style-type: none"> <li>- more peace than in a big city</li> <li>- lower building intensity</li> <li>- greater neighborly friendliness</li> <li>- proximity to a large city and at the same time the advantages of living outside it</li> </ul>	<ul style="list-style-type: none"> <li>- availability of recreational areas and greenery</li> <li>- Faktoria Cultural Park</li> </ul>	<ul style="list-style-type: none"> <li>- a quieter life than in a big city</li> <li>- good neighborly relations</li> </ul>	<ul style="list-style-type: none"> <li>- predominance of young residents</li> <li>- no visible border between Gdańsk and Pruszcz Gdański</li> <li>- after graduation, she intends to change her place of residence, but does not rule out returning when she starts a family</li> </ul>	<ul style="list-style-type: none"> <li>- peace and quiet</li> <li>- although she treats Pruszcz Gdański as the bedroom of Gdańsk, she declares willingness to permanently live in Pruszcz Gdański</li> </ul>

The conducted interviews showed that Pruszcz Gdański is an attractive place to live. Lower real estate prices than in Tricity allow having a larger flat or a house. Thanks to its good location close to Gdańsk, it is a kind of dormitory—a satellite town. All respondents commuted to Gdańsk every day to work or study but used services in Pruszcz Gdański, although younger people declared going shopping to Gdańsk. The inhabitants appreciated the quality of life in the town, and above all its lower pace.

## 5. Discussion

Historically, Pruszcz Gdański did not have a clearly marked functional city center, which has been artificially planned only in recent years. It resulted in the creation of functional public spaces with pedestrian zones and the main square [75]. Traditionally, around them, there was a zone with shops and other services. Large agricultural areas situated in the north-western part of Pruszcz Gdański enabled the development of multi-family housing. Relatively cheap plots whose transformation into areas intended for residential and service development was planned in the Development Strategy of the Municipality of Pruszcz Gdański created an opportunity for the town's development [26]. Lower costs of real estate from the primary market in comparison to prices in Tricity, even in the peripheral districts of Gdańsk, were attractive especially to young people. As one of the major advantages in the survey, many people moving to Pruszcz Gdański as well as its permanent residents indicated lower real estate prices or a possibility to buy a flat or a house of a higher standard than in Gdańsk for the same price. Additional advantages of Pruszcz Gdański include a smaller scale of the town, access to all necessary services and a slower pace of life, which was particularly emphasized by the people with whom in-depth interviews were conducted.

The phenomenon analyzed in the article is not exceptional, but it well illustrates the problems of functioning and development of contemporary metropolitan areas. The Tri-City is a special example, because apart from its important functions as a provincial and academic center, it is also an important tourist destination. All these factors contribute to the fact that the quality of life in the Tri-City, and in particular in Gdańsk, increases, but at the same time difficulties arise for permanent residents. The development of residential areas is related not only to the demand among residents, but also as a response to the needs of students and tourists (apartments for rent), foreign residents who want to have a second home in Gdańsk (this applies especially to Germans and Swedes, due to traditional ties with Gdańsk). As a result, suburbanization appears, which is a typical contemporary phenomenon, but may be intensified in countries such as Poland, not only by the desire to have your own house in the suburbs, where living conditions may be better than in the city, but also due to real estate prices and costs everyday life. Due to its proximity to Gdańsk, Pruszcz Gdański is an attractive place to live. Although the problem of creating a new housing and service sub-center described in the article, in isolation from the existing city structures, is important, the migration from the Tri-City, and in particular from Gdańsk to Pruszcz Gdański, is an added value for the satellite city. There is a large group of young inhabitants, usually well-educated, who increase the city's potential. The residence of such people in the satellite city, on the one hand, contributes to the creation of a metropolitan city bedroom, but on the other hand, it affects the potential of locating new enterprises in Pruszcz Gdański that need an educated society in their surroundings. An important and positive effect of migration to Pruszcz Gdański is also the aforementioned growing level of society, which may affect bottom-up activities and improve the quality of the city's functioning.

The conducted analyzes indicate that the phenomenon is similar to other large Polish cities. The suburbanization of Gdańsk and its spreading to neighboring municipalities and towns is a typical phenomenon for Poland, but also for other large agglomerations in post-communist countries of Central and Eastern Europe [9–11,14–16]. This phenomenon has a significant dynamic, perhaps greater than in the countries of Western Europe [13], because as a result of the political and economic transformation, most of the socio-economic phenomena “make up” their time. Apparently, the phenomena take place in Poland in Kraków [55], Warsaw [32,56] and Wrocław [17,49].

## 6. Conclusions

The article examines the influence of a large city with a metropolitan function—Gdańsk, on the functional and spatial structure of a small neighboring town—Pruszcz Gdański, which has been defined as a satellite town. The research procedure assumed an

analysis of changes in spatial development in the years 2005–2020 based on a comparison of orthophotomaps, as well as a qualitative analysis of planning and strategic documents of the municipality of Pruszcz Gdański. A dynamic increase in single-family buildings in the north-eastern part of the town and multi-family buildings in the north-western part was identified. At the same time, an analysis of the number of inhabitants showed a positive many-year migration balance. Noting the convergence of both phenomena, a questionnaire survey and in-depth interviews were conducted with residents in order to determine the factors conducive to the process of settling down in Pruszcz Gdański [83]. Thanks to the applied methods, it was possible to verify the hypotheses resulting from the formulated research questions.

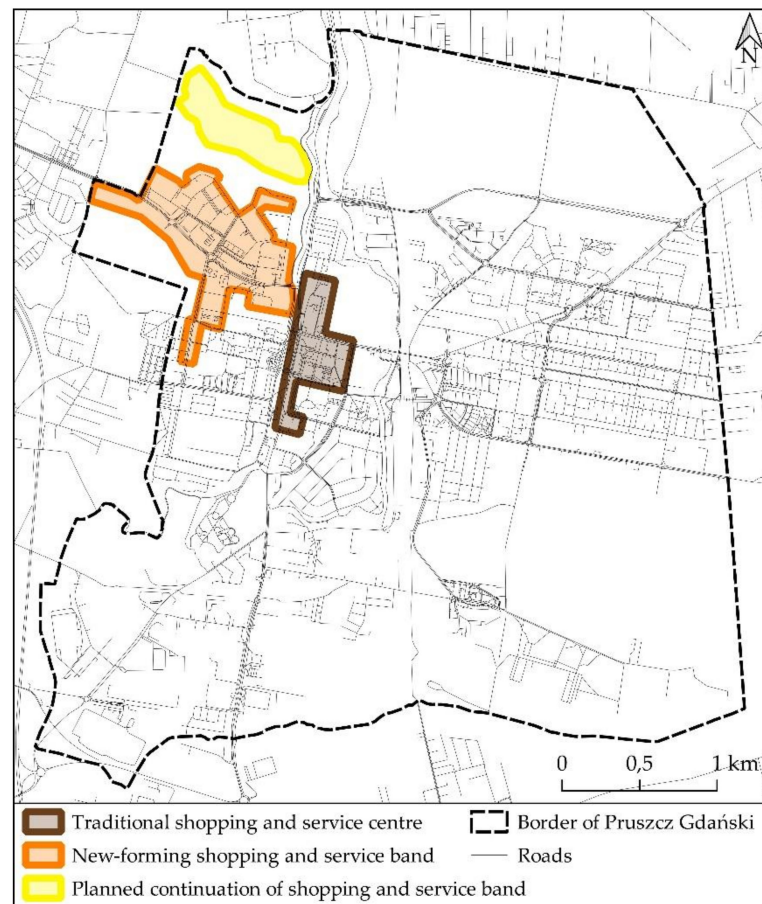
Although Pruszcz Gdański has been developing independently since the Middle Ages, due to its location and proximity to Gdańsk, it has always been associated with it. However, both cities developed independently until the beginning of the 21st century, when a dynamic process of suburbanization took place. Then, Pruszcz Gdański became a cheaper alternative to Gdańsk, both in terms of the purchase property and the cost of living. Due to the many-decade development of various typically urban functions, Pruszcz Gdański offers its residents all the necessary functions, although the residents indicated that they use some of them in Gdańsk—perhaps due to a better supply or using them on their way to or from the place of work/study. Therefore, it has been proven that Gdańsk has a strong influence on the functional and spatial structure of Pruszcz Gdański. It is mainly young inhabitants of Gdańsk who settle down in the northern part of this satellite town and who are invariably connected (usually professionally) with the city of origin.

One can wonder to what extent the proximity of Pruszcz Gdański to a metropolitan city has contributed to the dynamic increase in the number of inhabitants and has led to changes in the development. Definitely, the influx of people of working age is a favorable phenomenon for Pruszcz Gdański. Accessibility to public transport, which has been shaped for several decades, does not stratify the town, but the concentration of new multi-family buildings in the north-western part of Pruszcz Gdański has led to the creation of a retail and service sub-center (Figure 9). As a result, inhabitants of this part of the town do not even visit the traditional city center, where trade is dying down or has become severely limited. Therefore, a kind of “town within a town” was created—a satellite of Gdańsk. The proximity of the core of the metropolis and new housing estates in the northern part of Pruszcz Gdański allows maintaining home–work or home–study ties in daily commuting to Tricity. The routes of this commuting naturally bypass the center of Pruszcz Gdański, which has an impact on the limited use of the town’s values, including the services offered there. Relatively low real estate prices are the most important factor shaping the modern directions of development of Pruszcz Gdański.

The conducted analysis shows that Pruszcz Gdański, or rather its northern part, is *de facto* a satellite/peripheral district—the dormitory of Gdańsk. The question whether the growing population density outside Pruszcz Gdański already means suburbanization of this town or is still a process of the metropolis sprawl remains open. This is an issue worth exploring in the future, similarly to the dynamics of changes in real estate prices. Due to the popularity of new flats and the generated demand, prices may be inverted in Pruszcz Gdański.

A demographic structure untypical of Polish cities is being created, with a predominance of people in the productive and pre-productive age [84]. The housing development in the north-western part of Pruszcz Gdański, so to speak, tears this part away from the town, because the people living there are mainly linked to Gdańsk in their everyday life. The inhabitants of Pruszcz Gdański notice changes in the town’s spatial development, in particular in the creation of a commercial and service sub-center related to the construction of new housing estates. Both immigrants and indigenous residents perceive life in Pruszcz Gdański positively and assess it as a beneficial alternative to living in a metropolitan city.





**Figure 9.** The emerging shopping and service band compared to the traditional one located in the town center (source: own elaboration based on [27,28]).

In response to the research questions posed at the beginning of this article, the following conclusions can be formulated:

1. Despite the significant migration from Gdańsk to Pruszcz Gdański and the creation of a residential and service sub-center in a smaller town, partially with the functions of a large “city bedroom”, Pruszcz Gdański is fully independent and meets all the most important needs of its residents,
2. Metropolitan city, in Polish conditions, strongly influences the functional and spatial structure of the satellite town. This is mainly due to real estate prices and the cost of living in a large city. In particular, young residents migrate to a smaller town to buy their own apartment or house and look for cheaper living costs,
3. The phenomenon of migration from Gdańsk to Pruszcz Gdański has a significant impact on the functioning of a smaller town,
4. Residents of Pruszcz Gdański perceive the changes in the spatial development of the town, which are the result of migration, but at the same time perceive them positively. Thanks to the new residents, there are accompanying services that are needed by all residents of Pruszcz Gdański,
5. The proximity of Gdańsk, however, affects the spatial stratification of Pruszcz Gdański. The creation of a new residential and service sub-center in the north-western part of Pruszcz Gdański may lead to the degradation of the traditional town center.

The conducted analyses showed that the influence of the metropolitan city on the functional and spatial structure of the satellite city is significant. The article adds to the scientific knowledge about the mutual relations of two cities in the socio-economic conditions of post-socialist Central and Eastern Europe. The main achievements include the

identification of factors influencing migration between the cities of Gdańsk and Pruszcz Gdański, as well as the determination of the impact of migration on changes in the functional and spatial structure of Pruszcz Gdański. An important element is to determine the impact of creating a new residential and service center on the willingness to continue using the traditional service band. It can be concluded that the currently built bedroom for Gdańsk in Pruszcz Gdański becomes a fully functional “city” where residents can use all the necessary services and do not move to the center of Pruszcz Gdański and Gdańsk for this purpose.

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