



## MORPHOLOGY OF CENTRAL BUSINESS DISTRICT IN WARSAW

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Business districts are quite new and characteristic urban patterns in European cities. High rise office building concentrations of this type, where mostly international enterprises are located, are a significant element in an urban fabric. They are generators of economic growth and spatial changes. Localization of offices and other facilities within business districts gives them a distinctive spatial structure. In Polish cities, business districts are still considered a new phenomenon, and thus require descriptive investigation. The goal of this paper is to examine the biggest and the most significant Polish business district. As a case study, the Central Business District in Warsaw is taken into consideration. Its formation was a consequence of a communist meltdown and subsequent economic growth in Poland in the early 1990s. The Warsaw business district is relatively new in terms of town planning and urban design. Moreover, new buildings are still appearing, contributing to district expansion. This concentration of office buildings is located in downtown, near the historical center of Warsaw. The strategic localization in the city and its economic significance make this district an important urban pattern in metropolitan area. The aim of this paper is to examine transformations in urban space in the Central Business District in Warsaw. The analysis investigates functional structure, historical structure and spatial density. Final results present spatial structure of Central Business District in Warsaw.

**Keywords:** Business district, Warsaw, Spatial analysis.

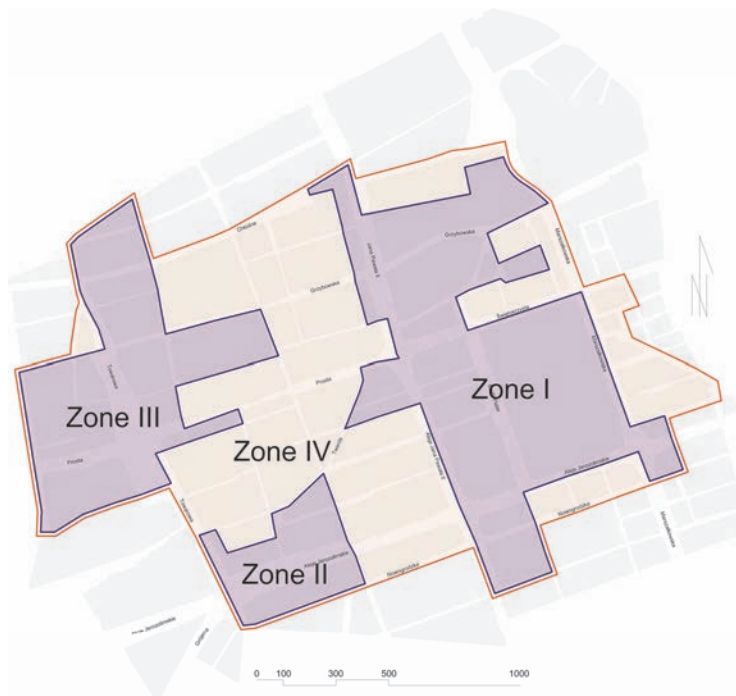
### Introduction

Warsaw is an important economic center in Poland and Central Europe. Numerous worldwide companies and corporations have their seats or branches there [Keivani, Parsa, and McGreal, 2002]. Further, Warsaw, as a capital city, is one of the better-developed metropolises in Poland. Strong economic position in the country and Central Europe has a huge impact for changes in the urban structure of the city. International companies require special urban environment, such as high class office spaces, hotels, luxuries services and an efficient transportation system. However, all this requirements cause changes in the urban tissue. Hence, the central part of Warsaw has changed since 1990s. A big and significant concentration of office buildings has appeared. New investments like office buildings, hotels, apartments, and services provide the district with a new dimension. It is not residential area any more. Nowadays, it is economic-orientated development which can be called a Central Business District [Lisowski, Wilk, 2002]. It is probably the only one such urban structure in Poland - a large concentration of skyscrapers located in the city center.

The Central Business District in Warsaw occupies a typical location. It is necessary to remember that historical conditions of urban tissue in Warsaw are very strong and the traditional

centre of the city is conditioned by historical urban structure. There is very little space for new and big investments. Therefore, the concentration of office buildings has found a characteristic sitting around the main train station in Warsaw ('Warszawa Centralna') - between the historical centre and the airport ('Okęcie'). It is a typical downtown location which is an arrangement of housing and various services [Miejscowy plan zagospodarowania przestrzennego w rejonie Pałacu Kultury i Nauki uchwalony uchwałą nr XCIV/2749/2010 Rady m.st. Warszawy z dnia 9 listopada 2010 r.]. Many essential amenities are provided for international companies in that sort of localization [Aranya, 2003]. One of them is the access to the city centre. In case of Warsaw, the city centre overlaps with historical centre. However, the new centre can be delimited near the main train station in Warsaw, inside the Central Business District area [Lisowski, Wilk, 2002]. Closeness to the international airport 'Okęcie', a crucial advantage access to which is provided by public and private transportation system [Murphy, Vance, 1954]. What is more, the city's most important public transportation nodes lie within the area of the major office concentration in Warsaw. The metro station ('Metro Centrum') and the main train station ('Warszawa Centralna') provide efficient transport links with different parts of the metropolis and with other cities in Poland and abroad. All these elements make this area attractive for all kinds of companies and contribute to a successful development of the business district.

The Central Business District in Warsaw does not have a compact functional structure. A method to demarcate the border of office buildings concentration had to be established. All quarters where offices or activities closely connected with business sector (hotels, apartments) are more than 30% (building total floor space) are taken into consideration as a business district area. According to this method, three main concentrations of office buildings can be delimited (Figure 1.).



**Figure 1.** Division into Zones.

Source: own compilation

Zone I (approximately 93 ha) is the biggest and the most significant one. This concentration of office buildings, hotels, apartments and services is located mostly along Jana Pawła Street,

Grzybowska Street, Marszałkowska Street and Jerozolimskie Avenue. In the southern part of Zone I, the train station and metro station are located - the main public transportation nodes in Warsaw. The centre of this zone, but not the geographical centre, is in and around the main train station 'Warszawa Centralna' and shopping centre 'Złote Tarasy', which are functionally connected. The second and the smallest one is Zone II - approximately 17 ha. This zone is situated near the intersection of two main streets: Jerozolimskie Avenue and Towarowa Street. Two skyscrapers - 'Warta Tower' and 'Millennium Plaza' are a base of this area. The next one is Zone III, which stretches along Towarowa Street and Prosta Street. It is a typical post-industrial area, where new investment like offices, hotels and luxuries apartments are appearing. The total area of Zone III is approximately 55 ha.

To examine the urban morphology of the Central Business District in Warsaw better, it seems necessary to also evaluate what is happening between the three main concentrations of office buildings. That is the reason why the three zones and the whole area between them are considered the research area. Therefore, the total area of the Central Business District is approximately 307 ha. The research area begins with Marszałkowska Street in the east and finishes with Towarowa Street in the west. The border in the north follows Chłodna Street and in the south mostly along Nowogrodzka Street.

The aim of this paper is to examine the urban morphology of the Central Business District in Warsaw. However, not all spatial aspects could be taken into consideration. Therefore, the research focuses only on three main spatial structures: functional structure, historical structure and spatial density. The central question of the research is how the three structures are built. The next issue to investigate is what kind of relations are there between these three structures. As the best available tool to measure and compare all activities in the Central Business District, building total floor area is chosen - a product of multiplication of 'ground floor area' and 'number of stories'.

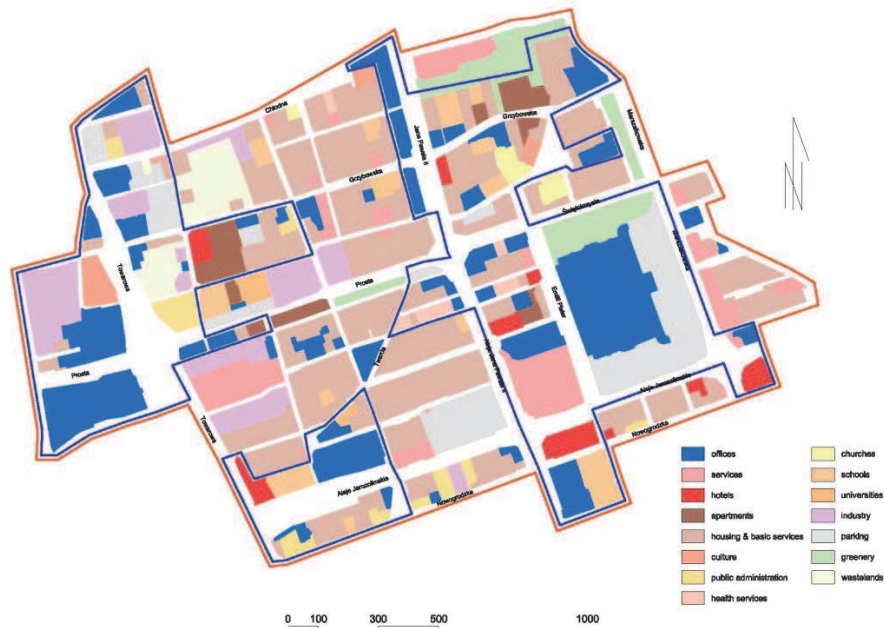
## Three Structures

### Functional Structure

According to Raymond E. Murphy [1972], a business district should not include only offices. A successful business centre is a combination of various land uses providing all basic amenities for companies located there. Moreover, functional diversity serves as an opportunity to create a multifunctional centre - a vivid part of a city, attractive for investors and citizens [Trip, 2007]. In order to examine the functional structure of Warsaw's Central Business District, basic groups of different activities have been established:

- offices
- housing & basic services
- services
- hotels
- culture
- health services
- public administration
- sport and entertainment
- schools

- universities
- temples
- industry



**Figure 1.** Map of functional structure.

Source: own compilation

Office buildings are spread irregularly on the whole of the research area (Figure 2). Hence, the Central Business District in Warsaw does not have a uniform functional structure. The reason is the downtown location and the established historical structure of this part of the city. Offices can be built only on free plots between other activities. However, some general rules of situating office buildings can be observed. In order to provide access to transportation system, the majority of offices is located along the main streets, mostly along Towarowa Street, Jana Pawła Street and Jerozolimskie Avenue. What is more, main street junctions seem to be the most attractive, but even small crossings are significant as nodes of transportation system. Despite the huge dispersal of offices, three main concentrations of office buildings can be delimited. They overlap with the three zones which were established before. In other words, Zones I, II and III are business neighbourhoods of the purest type in all research area.

The first office concentration is along Jana Pawła II Street (Figure 2). This accumulation coincides with Zone I, which is the biggest and the most substantial one. The heart of Zone I is the train station ('Warszawa Centralna'), which is functionally connected to the huge commercial centre ('Złote Tarasy'). Moreover, one of the most characteristic and significant buildings in Warsaw is located here - the Palace of Culture and Science. This monument of socialist architecture is the mixture of culture, public administration and offices uses. Office buildings in this zone are located mainly along Jana Pawła II Street, from 'Intraco II' ('Oxford Tower') on the south to 'Atrium Centre' in the north. The average distance between two extreme points is around 1,5 km. In practice, Zone I creates the second city centre, competing with the

historical centre. The large scale of land use proves that it is a typical business area. Offices comprise around 46% of building floor area here, next is housing and basic services - 28 %, and on the third position are hotels - 11%.

The next concentration of office buildings is situated along Jerozolimskie Avenue, near the junction with Towarowa Street (Figure 2). Zone II is the smallest and occupies approximately 17 ha. Two skyscrapers are the base of this business zone - 'Warta Tower' (82 m) and 'Millennium Plaza' (124m). Offices take up 47% of the total floor are of the building, while housing and basic services occupy 34%, which is not a significant difference.

Zone III is located in a typical post-industrial area of Warsaw ('Ochota') (Figure 2). Offices occupy plots after industrial activities. What is interesting, only in this zone offices comprise more than half of all building floor area - 52 %. On the other hand, industrial activities are only 3%, because industrial buildings usually have only one or two stories. The central point of Zone III is the junction of Prosta and Towarowa Streets, where the major offices are situated.

Despite the delimitation of the three main office buildings concentrations, the tendency of offices to spread into Zone IV can be observed quite easily (Figure 2). Offices appear as new investments on free plots in Zone IV. This phenomenon shows that some natural drift of the three Zones to merge into one is quite strong.

If the whole research area is taken into account, the principal function is housing and basic services - 46 % (Table 1). The reason for that is the downtown location where usually residential functions dominate. What is more, housing has a stronger foundation here because the residential district was here first. Offices (32%) only fill empty spaces between the existing buildings. Because of the downtown location, functions like services (5%), hotels (7%), culture (5%) and public administration (2%) are quite frequent.

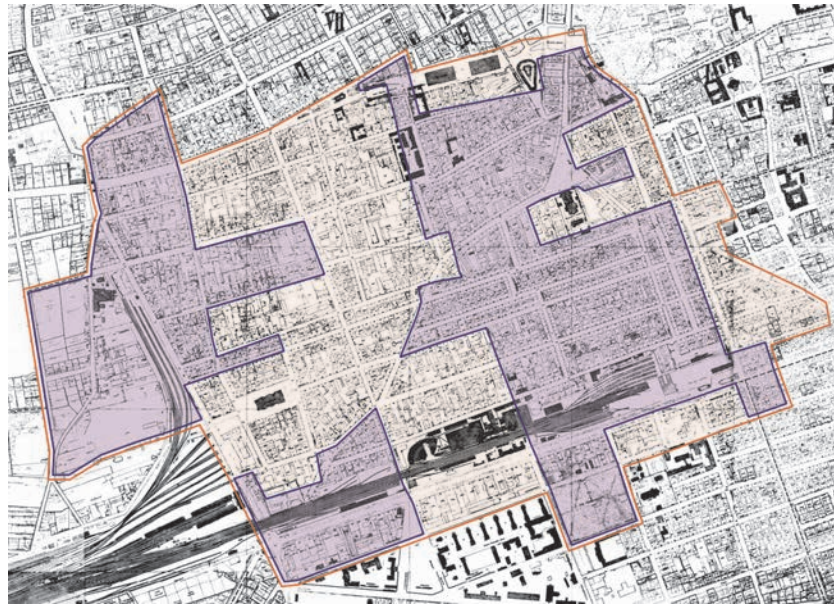
**Table 1.** Functional structure in Zones, according to building floor area (%).

Source: own compilation

offices	housing & basic services	services	hotels	culture	health services	public administration	sport and entertainment	schools	universities	temples	industry	unit
<b>Zones I, II, III and IV</b>												
15588 90	2220 486	23725 5	355 244	16 99 08	174 25	10181 3	6200	452 39	2286 4	81 48	61 83 4	m <sup>2</sup>
<b>32</b>	<b>46</b>	<b>5</b>	<b>7</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	%
<b>Zone I, II and III</b>												
14167 66	839 274	110 418	340 292	156 945	146 33	476 33	6200	239 19	6432	29 77	216 28	m <sup>2</sup>
<b>47</b>	<b>28</b>	<b>4</b>	<b>11</b>	<b>5</b>	<b>1</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>1</b>	%
<b>Zone IV</b>												
14212 4	138 121 2	126 837	149 52	129 63	279 2	541 80	0	213 20	16432	51 71	402 06	m <sup>2</sup>
<b>8</b>	<b>76</b>	<b>7</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>2</b>	%

Completely different proportions appear if functions only from Zone I, II and III are considered (Table 1). Analyses show that offices dominate in each business area (47%). However, housing is still on the second position (28%). The opposite situation is in Zone IV (Table 1). Housing and basic services comprise here approximately 76% of floor area. These proportions prove that it is a typical residential area. The other functions like offices (8%), services (7%), hotels (1%), culture (1%), public administration (3%) and industry (2%) occur, but disproportion between them and housing is too substantial.

### Historical Structure



**Figure 2.** Historical map of Warsaw from 1936.

Source: own compilation.

According to historical map of Warsaw from 1936, the spatial structure at the beginning of the last century was completely different than today's (Figure 3). 19th century residential districts with regular quarters of tenement houses dominated. The trauma of WWII has made the modern spatial structure of Warsaw very different from the pre-war one, and only a few streets and quarters overlap with the historical layout.



**Figure 4.** Types of buildings, according to historical time periods.

Source: own compilation.

The modern spatial structure is a mix of three structures from three different periods of time (Figure 4), (Figure 5). The oldest buildings were built before 1939 (12%). Unfortunately, few tenements remain after WWII, and as a result, the structure of historical buildings is very irregular (Figure 5). They are spread throughout the whole research area and do not make one compact urban structure. The second historical structure was created between 1945 and 1989, i.e. during the communism era in Poland (40%). Mainly blocks of flats represent this period of history. The third structure was formed in the last two decades (48%). New implementations found perfect locations in free spaces between the older buildings (Figure 5).

**Table 2.** Historical structure in Zones, according to building floor area (%).

before 1939	1945-1989	after 1990	unit
<b>Zones I, II, III and IV</b>			
598540	1911070	2295696	m <sup>2</sup>
<b>12</b>	<b>40</b>	<b>48</b>	%
<b>Zone I, II and III</b>			
145889	933247	1907981	m <sup>2</sup>
<b>5</b>	<b>31</b>	<b>64</b>	%
<b>Zone IV</b>			
452651	977823	387715	m <sup>2</sup>
<b>25</b>	<b>54</b>	<b>21</b>	%

Source: own compilation.

If building total floor area is considered, buildings after 1990 dominate (48%) (Table 2). On the other hand, the structure built between 1945 and 1989 has almost the same amount (40%). What is more interesting, modern buildings (after 1990) dominate in the ‘business’ Zones I, II and III (64%). Equally, completely different proportions are in the ‘residential’ Zone IV where structure from 1945-1989 is the most common (54%).



**Figure 5.** Map of historical structure.

Source: own compilation

### Spatial Density

**Table 3.** Spatial density in Zones, according to building floor area (%).

Source: own compilation

Zones I, II, III and IV				
1-3	4-7	8-19	20 and above	unit
431086	1372026	1652406	1349788	m <sup>2</sup>
9	29	34	28	%

Spatial density is represented as a number of stories. It is the best available method to provide essential data in this research. The majority of buildings have 8-19 stories (34%) (Table 3). Buildings with 4-7 stories ( 29% ) and more than 20 stories (28% ) are on the second position. The least common buildings are 1-3 stories high (9% ). Unfortunately, groups of buildings with the same number of stories do not make any regular spatial framework (Figure 6). What could be characteristic for this research area, the average number of stories in all business Zones I, II and III is bigger that in Zone IV (Figure 6). Furthermore, a few groups of buildings over 20 stories can be delimited (Figure 6). All of them are in Zone I, II or III, therefore in business areas [Oleński, 2007].



**Figure 6.** Spatial density, according to number of stories.

Source: own compilation.

## Comparison of Three Structures

In this chapter, the three structures are compared to each other, and relationships between these elements are examined. Results present relationships and show how the urban structure works.

### Functional Structure and Historical Structure

The comparison of functional structure and historical structure delivers information about relationships between various functions in different periods of time. Three main historical phases are presented on the horizontal axis: before 1939, 1945-1989 and after 1990 (Table 4), while primary functions are located on the vertical axis (Table 4). Hence, this matrix shows how land uses have been changing in different time periods (Table 4). The clear conclusion is the fact that specific functions appear in particular periods of time.

**Table 4.** Comparison of functional structure and historical structure.

	Historical structure		
	before and 1939	1945-1989	1990 and after
Functions	Housing and basic services (tenement-houses) Temples	Housing (blocks of flats) Industry Culture Health service Public administration Education	Offices Hotels Housing (apartments)

Source: own compilation

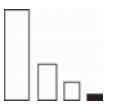
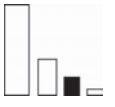
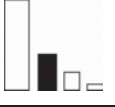

Housing and basic services dominated mainly before 1939, what was characteristic for a downtown area. Unfortunately, regular urban patterns of tenement houses did not survive the Second World War disaster. Nowadays, only single tenements houses and temples represent this period of time (Table 4).

Afterwards, housing (block of flats) appeared primarily between 1945-1989 (Table 4). Lack of housing after WWII was the main reason of that tendency. Much housing were built during that time, especially blocks of flats. The north-western part of the research area was designated as an industrial area, which explains the large amount of industrial activities in that period of time. Because of the downtown location, functions like culture and public administration appeared in this area. Health service and education, as support to housing, also come from that time period. Summarizing, almost all investments were orientated on residential development and on other functions closely connected with housing (health service and education) or central functions (culture and public administration) between 1945 and 1989 (Table 4). Nowadays, the majority of residential activities in the research area is form that phase.

The development orientation changed at the beginning of 1990s. Most investments are currently focused on business sector development [Tasan, 1999]. Offices, hotels and luxurious apartments dominate among new investments (Table 4). It shows that the functional character of this part of the city is changing. Today, it is not a predominantly residential area any more, but a multifunctional business district.

## Functional Structure and Spatial Density

Table 5. Comparison of functional structure and spatial density.

Number of stories		Functions
	1-3	Temples , Education, Industry, Services
	4-7	Culture, Housing (apartments) Housing and basis services (tenement-houses) Health service, Public administration
	8-19	Housing (blocks of flats)
	more than 20	Hotels, Offices

Source: own compilation

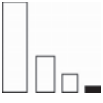

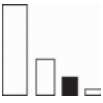

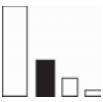



Functional structure and spatial density are compared in order to find relations between different land uses and the number of stories. The analyses present what sorts of buildings are typical for which functions (Table 5). The vertical axis categorizes buildings by the number of stories. Main partitions are established: 1-3, 4-7, 8-19 and more than 20. The horizontal axis is occupied by different functions.

The partition from 1 to 3 stories is dominated by temples, education, industry and services. However, culture, housing (tenement houses and apartments), public administration and health services are mostly 4-7 stories. What is more, 8-19 stories is also represented by housing but mostly blocks of flats. More than 20 stories is characteristic for offices and hotels.

This analysis shows that functions connected with the business sector are usually more than 20 stories (Table 5). Furthermore, the spatial density of the research area is rising due to the fact that many new skyscrapers are appearing [Oleński, 2007]. This fact has a strong influence on the visual character of the business district. In other words, the spatial density of the Central Business District in Warsaw is increasing because of new investments generated by the business sector.

Historical Structure and Spatial Density

Table 6. Comparison of historical structure and spatial density.

Number of stories		Historical structure		
		before and 1939	1945-1989	1990 and after
	1-3			
	4-7			
	8-19			
	more than 20			

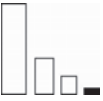
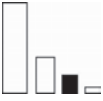
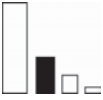

Source: own compilation.

The last contrast is between the historical structure and spatial density. The aim of this comparison is to learn about relationships between heights of buildings in three different periods of time.

Buildings from partition 4-7 were the most common before 1939 (Table 6). During that time, mainly tenement houses dominated, for which the most frequent number of stories was 5. A completely opposite tendency was between 1945 and 1989. In those days, mostly high (8-19 stories) and small (1-3) buildings were constructed (Table 4). Residential areas were dominated by high blocks of flats (8-19 stories) and supported by basic activities in small buildings (1-3). A tendency to build higher and higher buildings has continued in the last two decades (Table 6). Most of new implementations today have more than 20 stories, and skyscrapers dominate in this business district. Therefore, the Central Business District has very high spatial density. What is also interesting in these analyses, all three periods of time have their particular spatial densities. In other words, one height of buildings is characteristic for one historical period.

## Structural Matrix

Table 7. Structural matrix.

Number of stories		Historical structure		
		before and 1939	1945-1989	1990 and after
	1-3	Temples	Education Industry	Services
	4-7	Housing and basis services (tenement-houses)	Culture Health service Public administration	Housing (apartments)
	8-19		Housing (blocks of flats)	
	more than 20			Hotels Offices

Source: own compilation.

The final result of the analysis is a structural matrix, which presents relationships between the three main elements of the Central Business District in Warsaw: functional structure, historical structure and spatial density (Table 7). All constituents and dependencies between them are specified. Changes in functional structure in terms of historical periods and spatial density are shown. The structural matrix includes all principal elements of the morphology of the Centre Business District in Warsaw.

If historical structure before 1939 is considered, only temples and tenement houses with basic services represent this period of time in the research area (Table 7). What is more, temples are only from the 1-3 stories partition and tenement houses from 4-7 stories (Table 7). However, most of the housing and other functions closely connected with residential development appeared between 1945 and 1989 (Table 7). It was caused by the WWII damage, free spaces in the city centre and the necessity of new flats for citizens. The majority of blocks of flats comes from that phase and is between 8 and 19 stories (Table 7). Therefore, the spatial density of Warsaw rose in that time and now the visual character of this part of the city does not resemble the spatial structure from the 19th century any more. The urban framework was not reconstructed according to historical structure from before WWII. Nowadays, the changes in the urban pattern are irreversible. The introduction of blocks of flats stimulated the creation of new functions which supported housing. Education and health service are the most characteristic and common representatives of such services from that period of time. Schools are situated usually in 1-3-story buildings while health service often occupies buildings between 4-7 stories (Table 7). During that time, many functions connected with downtown location appeared in the research area. It was mainly culture and public administration which usually occupy 4-7 stories edifices (Table 7). The socialism meltdown and the appearing of capitalism on the edge of 1980s and 1990s was also a very significant moment for Polish urbanism. Spatial changes, economic

development and a new urban dimension are easily visible in the case study of the Central Business District in Warsaw. This district changed its character from a residential area into a multifunctional and international city centre. The easily visible results include modifications in the urban structure, especially in the functional structure and spatial density of this part of Warsaw. After 1990, most of new investments were orientated for economic development (Table 7). New services appear, but mainly as huge commercial centers (Table 7). They are located mostly in 1-3 stories building because it is the best height for that sort of functions from the economic point of view. If new housing appears, it is usually luxurious apartments (4-7 stories) located on free plots between existing buildings. It is necessary to emphasize that apartments are completely different type of flats, orientated for a different type of clients than traditional housing. They are even more connected with business sectors than with traditional residential activities in city. As temporary accommodations for business sector, many high class hotels are also present. They are mainly high-rise buildings over 20 stories [Oleński, 2007].

The most important and significant new investments in the research area are office buildings which change the functional character of this part of Warsaw and create its business center. The spatial density of offices is very high, where mostly skyscrapers over 20 stories dominate. New implementations contribute to the new dimension of this part of the city and constitute the Central Business District.

## Conclusion

The present research provides new knowledge about the Central Business District in Warsaw. The morphology of the business centre is explained through relationships between the three main elements: functional structure, historical structure and spatial density. Changes and dependencies in this unique urban structure are presented.

Some main conclusions from the analysis can be highlighted. First, this part of Warsaw was a typical downtown area before 1990, with domination of housing, basic services and functions typical for downtown location. What is more, the majority of historical urban structure was destroyed during the Second World War. Most of current streets and urban quarters were formed between 1945 and 1990. The breakthrough started in 1990s, and was caused by the communism meltdown and rapid economic development of Poland. Thus, the process of business center creation started.

Nowadays, business functions dominate in this part of Warsaw, hence it could be called a Central Business District. Because of the difficult history of the city, many spatial disasters, and the transformation, the Central Business District does not have pure functional and spatial structure. Residential structures are still quite visible and strong. It is hard to say where the border of the business district is. Three different structures from three time periods are visible. The disconnected functional structure does not give an impression of a uniform business district. The mixture of buildings from different time periods with extreme variety of heights makes the spatial composition of this district not satisfactory.

Despite of all disadvantages of this part of Warsaw, spatial changes are still interesting for a researcher. The Central Business District in Warsaw surely has a huge economic and spatial potential for successful development. However, it is still a big challenge for local authorities and urban planners to design and develop this area in the right way. Researches, like this one, can contribute to a better understanding of spatial processes and relationships in this area, making future projects better and helping avoid irreversible mistakes.

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