



MODELS FOR THE SPATIAL DEVELOPMENT OF MEDIUM-SIZED CITIES IN POLAND IN THE ERA OF TRANSFORMATION AS EXEMPLIFIED BY PUŁAWY, PŁOCK AND SIEDLCE

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Abstract

Post-1990, urbanisation in Poland took on new forms and features not very clearly on display in urban space before that time. Alongside a dynamic process of suburbanisation encompassing ever-greater areas around large cities, there has also been a phenomenon attesting to the occurrence of similar trends of the expansion of built-up areas with urban functions into areas around small and medium-sized urban centres. Taking shape are new wedges of urban construction pushing their way into suburban and rural areas. These are arising along access roads leading between the smaller cities and the large regional centres. It is not only services and industry that are located along these (as was shown in the classical model after Hoyt), since there are also estates of single-family or multi-family housing. The aim of the work described here has thus been to analyse the processes referred to as they are exemplified by the Polish towns or cities of Płock, Siedlce and Puławy. The comparative method deployed in this work is to lead to a proposal for a model of the development of Poland's urban centres of medium size.

**MODEL ROZWOJU PRZESTRZENNEGO ŚREDNICH MIAST W POLSCE
W OKRESIE TRANSFORMACJI NA PRZYKŁADZIE PUŁAW, PŁOCKA I SIEDLEC****Mirosława Czerny¹, Andrzej Czerny²**¹Wydział Geografii i Studiów Regionalnych
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Słowa kluczowe: średniej wielkości ośrodki miejskie, modele ekspansji przestrzennej, transformacja urbanistyczno-przestrzenna, Polska.

Abstrakt

Urbanizacja w Polsce po 1990 r. przybrała nowe formy i cechy, które wcześniej nie były silnie eksponowane w przestrzeni miast. Obok dynamicznego procesu suburbanizacji, obejmującego coraz to większe obszary wokół dużych miast, pojawiają się zjawiska świadczące o występowaniu tendencji ekspansji zabudowy o funkcjach miejskich na tereny wokół miast małych i średnich. Coraz więcej domów jednorodzinnych, magazynów i hurtowni, supermarketów i salonów sprzedaży itp. powstaje na terenach do niedawna rolniczych, które pierścieniem otaczają średniej wielkości miasta. Kształtują się nowe kliny zabudowy miejskiej wcinające się w tereny podmiejskie i wiejskie. Wzdłuż dróg wyjazdowych z mniejszych miast do dużych ośrodków regionalnych powstają nie tylko usługi i przemysł (jak to było pokazane w klasycznym już modelu Hoyta), lecz także osiedla mieszkaniowe domów jedno- i wielorodzinnych. Celem pracy jest analiza tych procesów na przykładzie Płocka, Siedlec i Puław. W pracy zastosowano metodę porównawczą i przedstawiono próbę określenia procesów rozwojowych na wybranych przykładach oraz syntezę w postaci modeli.

Introduction

Unlike a village, a town or city is an area of much more-diversified internal structure, physiognomy and functions; and this can be seen to apply to some extent even to small or medium-sized urban centres (i.e. those ranging from small towns through to larger towns and small cities), notwithstanding the inevitably more-limited diversity of land-use, function and social structure to be found in such centres, as opposed to in large cities. While the subject literature has tended to see small and medium-sized urban centres treated as contiguous but uniform areas of settlement not especially diversified in functional and spatial terms (Bański, 2007), there seems little doubt that processes also ongoing in the towns or cities of this group are ensuring ever-greater diversity where both function and forms of land-use are concerned.

In presenting the functional and spatial structure of an urban area use is *inter alia* made of graphic images, which – as abstract models – allow for generalisation regarding urban processes and forms of physical development. Geographers have been more than ready to adapt the Chicago models to

meet their needs, with most analyses of the spatial structure of cities around the world basing themselves around these concepts. However, the realities of the 21st century, and the uninterrupted processes of change and transformation ongoing in urban space, necessitate updating in response to a question as to just how adequate the above models can prove, in encapsulating the logic and structure of today's towns and cities. In essence, can these models actually go on being applied to the presentation and analysis of urban morphology?

Among these and other issues, there appears a further question as to whether there are models for the medium-sized urban centre that allow the processes ongoing within it to be properly presented and understood. Any entitlement to join that particular discussion would first be founded upon analysis of changes in morphology and structure that real-life cities in the above category have actually been experiencing, in recent years.

Actors and animators associated with changes in the spatial structure of small and medium-sized urban centres

For many decades now, scientific disciplines including but not confined to geography and spatial planning have been looking at urban processes, and most especially those concerned with the transformation of city space and the expansion of its urbanised area into non-built-up areas (often even agricultural). Detailed analysis of the development of towns or cities in different parts of the world made it possible for many descriptive and analytical or mathematical models of such urban entities to be devised, with these then serving as a basis for theoretical research, as well as the drawing up of strategies and plans for spatial development. In the geography of cities, many relevant studies appeared between the early 1970s and the end of the 1990s. The most new ideas and concepts concerning graphic models of urban space undoubtedly emerged in the 1970s and 1980s, thanks to German geographers, who admittedly based their analyses on models from the Chicago School, most especially Hoyt's sectoral model (Czerny, 2014). In turn, among the "Anglo-Saxon" models, the best-known is the concept for the spatial structure of urban areas developed for South America by Griffin and Ford (Czerny, 2014); while in regard to the French School, the key work is that of Batallon (Czerny, 2014).

The last quarter-century of the 20th century brought urbanisation processes of a particular dynamic, in both the developed world and poor countries experiencing far-reaching economic change. In many countries, the 1970s brought the emergence of institutions and government agencies tasked with promoting work to regulate land-use processes in urban areas and to introduce physical development plans (Stöhr, 1975). This was also true of comprehensive projects

involving urban infrastructure, in particular solutions regarding access to – and the scope of – urban transport. It was, for example, at this point that innovative work began on the building of a system of fast buses in Curitiba, Brazil – of a kind that many other cities around the world continue to implement and apply through to this day. New solutions also include the construction of aerial tramway systems within the city-transport context. This is a solution mainly adopted where cities are located in the mountains (as in the cases of Medellin, Colombia, and La Paz, Bolivia, for example). In Europe, systems of tramlines have also tended to be modernised and made more attractive. In turn, nothing less than futuristic are solutions applied to the operation of city transport, and the design of the means thereof, in the city of Montpellier, France¹. The remodelling and development of transport infrastructure has represented a response to cities' huge needs to integrate their different parts, as well as a desire for the forms by which use is made of space to achieve a higher level of cohesion and organisation.

So it is that the recognition and analysis of forms of spatial management and the internal structures of cities are among topics taken up most frequently by those researching urban geography. Hoyt's Model and modifications thereof are used in presenting the socio-functional structure of towns and cities in various parts of the world, with this taken to make clear the validity of this kind of conceptualisation being used in spatial research. Indeed, through to the late 1990s, the use of descriptive and analytical models was widespread, in line with an apparent conviction that there was no better way of conveying the complex structure of the objects studied, and no more effective available explanation as to processes and phenomena ongoing within them.

In fact, however, many of the models of city spatial structures devised in the 1970s and 1980s are of nothing more than historical relevance now (Göbel, 2015). Exceptionally dynamic processes leading to the spillover and sprawl of urban construction have been combining with associated functional and spatial fragmentation to ensure that neither Hoyt's original concept nor subsequent derived versions therefore were any longer capable of offering simple explanations for complicated real-life structures. Nevertheless, this may still prove a suitable moment for descriptive and analytical models to be applied more widely to medium-sized and small urban centres, given that both size and internal structure in this case ensure a lesser degree of complexity than applies to large cities.

A feature characteristic for the spatial development of urban centres of medium size selected for study is the way that built-up areas extend into suburbs.

¹ Here, the colour-scheme and designs used for the different tram lines went so far as to shape the identity of different districts of the city. Symbols for air, earth, water and fire were in fact applied to lines 1, 2, 3 and 4. The swallows (line 1) and flowers (line 2) are the work of well-known Swiss artist Mattia Bonetti, while the designs symbolising the sea (for line 3) and gold jewellery (line 4) are from French fashion designer Christian Lacroix (*Montpellier, la ciudad mediterránea de futuro*. 2012).

Until recently, researchers were prevalently of the opinion that a suburban zone only takes shape around large cities (Barbier, 1985). However, as early as in the 1960s, the relevant Polish literature was considering that every urban centre (town or city) had a suburban zone, irrespective of size (Malisz, 1966). This may have reflected the reality that, in the context of the spatial development of these centres, restrictions on agricultural land use giving way to construction were not always heeded rigorously, hence sprawl of the built-up area typical for towns and cities was to be noted in Poland, even in the communist era. At the same time, suburban zones were traditionally also characterised by a large role for agriculture in the land-use structure.

At the time, therefore, the Polish literature did not use the term suburbanisation to describe the development of suburban zones. Even Ludwik Straszewicz, while clearly having the phenomenon of suburbanisation in mind, only chose to apply the term suburban zone, which he then defined as an area extending from the point at which the contiguous built-up area of a city gave out, all the way through to genuinely rural areas (Straszewicz, 1985). In accepting that an urban centre of only medium size might also develop a suburban zone, it is necessary to emphasise how this is part of a town or city is most vulnerable to transformation and change. An existing urban centre shapes its suburban zone more appropriately, in so doing designating its main functions and spatial extent.

Since the time of Poland's transformation there has been no slackening of the pressure to obtain building land close a town or city; hence a thesis that can reasonably be advanced holding that, the stronger the given town or city economically, the more dynamic its suburban-zone development. It should be added here that obstacles to the cessation of farming activity in suburbs have disappeared, while the prices of building plots here remain far lower than those applying in the urban area proper. Furthermore, as the effectiveness of urban planning in Poland has been limited, Polish urban areas differ from those in Western Europe in that construction of an urban nature sprawls out far beyond the contiguously built-up area. S. Liszewski noted that the development of suburban zones takes place as the forces of agglomeration and deglomeration come into play (Liszewski, 1987). The growth of an urban centre (as manifested in increases in population and numbers of businesses, and diversification of function) is seen to be manifested in demand for new land. This in turn favours change of a functional and spatial nature within the already-urbanised zone, with a spillover of urban-type construction into suburban areas, only more rarely populated areas or areas only managed to a more limited degree. The zone encompassed by suburbanisation processes experiences expansion in new housing developments, as well as a diversification of economic activity. Many service firms of small and medium size also find good places to locate in suburban zones. There is dynamic development of economic activity – and forms of physical development – beyond agriculture; as well as an increase in population density as compared with surrounding still-farmed areas.

In Poland's towns and cities, a suburbanisation process first took in those urban centres in which dwellings were in short supply, or in which inhabitants packed into small flats constructed using the large-panel system more or less inevitably "expelled" young people towards the city limits. It was in these peripheral areas that many bought plots, making provision by themselves for the construction of houses – a process often taking many years to complete. So the mechanism underpinning Polish-style suburbanisation contrasted with that in American cities, in not initially being associated with the transfer of representatives of the wealthier social strata out of more central areas.

In the 1990s in particular, single-family housing went up on plots selected for their relative proximity to the main urban centre, in order that daily inward commutes could take place. However, as suburbanisation continued down the years it began to take in land more and more distant from central areas. Furthermore, it was ever-larger houses on large plots, or else groups of several houses within fenced housing estates, that were now coming into existence (Mantey, 2011); and this was a reflection of rising incomes in (parts of) society, as well as changes in lifestyle that saw more and more weight attached to owning one's own home with garden.

A further widespread phenomenon characterising post-industrial and post-modernist cities was the so-called urban sprawl – of built-up areas into the countryside, now beyond the city limits as such (Czerny, 2005). The result has been the appearance of new forms of physical urban space, as well as changing societal relationships, between traditional urbanised areas and new spatial forms whose features are urban, notwithstanding a location far from the city centre (Czerny & Czerny, 2009). This diffusion of the built-up area is first and foremost characterised by the presence of housing estates with urban-type construction and organisation, not only in the zone of true suburbanisation, but also in rural areas as such. According to Panadero Moya, small suburban localities are joined by villages located within daily commuting-to-work range for inhabitants of medium-sized urban centres in featuring an urbanisation processes that does entail rural-to-urban transformation of homes, forms of building and public space (Panadero Moya, 2009). This switching of built-up areas in the countryside involving the presence of typically-urban forms seems to be a new phenomenon particularly characteristic of the times we live in (Czerny, 2010; Czerny & Czerny, 2013).

The spatial development of Płock, Puławy and Siedlce – principal actors in the process

The analysis of spatial expansion of some selected medium-small Polish cities was carried out in the period from 2012 to 2017. Mid-sized cities with some common features were selected for analysis. They all lie in the eastern

part of Poland. During the communist period, large industrial establishments were created there. The influx of workers caused the development of housing construction – multi-family blocks. Similar forms of land use in the city and directions of spatial expansion after 1990 appeared.

As a result of the investigation of changes of land use on the basis of topographic maps and its comparison with actual building forms were drawn conclusions about the directions and intensification of urbanization. Then, the missing forms of the building presented on the maps were supplemented using satellite images. On the basis of a comparison of the range of different types of buildings in particular periods, analyzes of available literature and extensive theoretical knowledge on contemporary urban processes, models for the development of medium-sized cities in Poland were created.

The large towns and small cities selected for analysis here are all located in eastern Poland. In the past each was a more important local centre with a well-developed commercial function serving an extensive agricultural region. Each is located close enough to (i.e. less than 100 km from) a large urban agglomeration (be it either Warsaw or Lublin) for this to be a key factor shaping the forms of physical development. And in the economic structure of Płock, Puławy and Siedlce alike, it is the production-related and service functions that predominate, though the role of industry in the employment and income structure in these localities is much more limited now than in the communist era. However, many large plants are still in operation, providing employment for a majority of people who are occupationally active. In the case of Puławy, the main employer remains the nitrogen works, in Płock the oil refinery, and in Siedlce several large plants serving the farming and food industry (though no longer now the machinery and clothing industries as 30 years ago).

From the moment Poland went through its change of political and economic system, these three centres under study found themselves in crisis circumstances, as first and foremost caused by a decline in industrial output and consequent emigration to larger cities of people of productive age in search of work. From 2003 onwards, the situation began to stabilise well enough for populations to begin to rise once more. In contrast, numbers of people inhabiting adjacent gminas have mostly been in decline, with this being most visible in the powiat of Puławy. On the other hand, rural and agricultural areas on the outskirts of these urban centres (and in part also certain localities in the suburban gminas) have been encroached upon by single-family housing construction (i.e. single houses or groups of several homes), the owners here being those employed in urban centres. In the cases of all the localities studied, a villa-type suburban zone has taken shape on land that was previously agricultural and is located along the main thoroughfares leading towards large centres, or in areas attractive from the landscape point of view. Alongside permanent places of habitation, some of these houses are merely the summer residences of city-dwellers, most especially in the case of Płock, where mean incomes obtained thanks to

the presence of the petrochemicals industry are far higher than in other cities of the same size. This explains the construction by many of second homes in nearby forests or along rivers.

Płock

Płock is one of the oldest cities in Poland, and in the region of Mazowsze. It was for centuries a local centre of trade in articles used in agriculture. However, the Industrial Revolution proved favourable for the city, being associated with slow population increase and new stimuli to economic development. A location in central Poland between the two large urban centres of Warsaw and Gdańsk also encouraged the development of a commercial function. In turn, in the communist period, Płock became a national distribution centre for oil and oil-derived products, and a political decision taken in the late 1950s – that a petrochemical works should be constructed – sealed the city's further fate. For, over the next three decades (all the way through to the fall of communism), economic and spatial development in Płock was subordinated to that industrial function, and more precisely the needs of the said petrochemical industry. Today's city is of some 127,000 inhabitants.

In tandem with this development of the industrial function, there was from the 1960s onwards a development of housing construction; involving first buildings 2–4 storeys high and constructed from traditional materials (mainly brick), and then large new housing estates in the vicinity of the works and extending in the direction of the city centre. The erection of such block estates using the large-panel construction technique continued between the 1960s and 1980s, and led to a marked change in the functional and spatial structure of Płock. It became a priority for the new estates to be integrated (and physically linked via streets) with remaining urban areas.

At the outset, the new large-panel estates went up on brownfield sites existing between the chemical plant and the centre. In the same way the locations of the large industrial plants in the north-eastern part of the city ensured the designation of the first main axis of development, in the construction phase and in the early years during which these were in operation. However, from the 1980s, the area at the edge of the Brzeźnica Gully and along Imielnicka and Wyszogrodzka Streets (which run towards the south-east, i.e. towards the part of the city opposite Petrochemia) gave rise to first groups of housing estates comprising villa-like and other private homes (Czerny & Czerny, 2016).

Among the most radical post-1990 changes in the functioning of Poland's housing market was a shift from a market operating around contractors to an "investors' market", which is to say a free market. A normal system of distribution retook its proper place, with a dwelling then becoming a good, as opposed to some (very) desirable asset that the state was able to distribute at will. Economic

and political changes were naturally accompanied by changes in society, which – in the case of the housing sector – manifested themselves in a very large scale (indeed a "mass") flight of inhabitants from prefabricated multi-family housing... to places to live in new multi-family buildings of much higher standard, or first and foremost to own homes located in the suburbs.

There thus began a process of the very rapid, only poorly-controlled and at times simply chaotic expansion into agricultural areas of urban-type housing construction (be it single-family, low-rise multi-family or of the small residential complex type). It is even common for these new estates to be located in the midst of cultivated fields, at the end of a dirt access road virtually impassable in periods of heavy rain and in winter. But access roads do not represent the only lacking infrastructure, as very often these localities also lack water pipelines, sewerage and even refuse collection services. It is usual for such a process of the "deruralisation" of farming areas as described in the literature to be prolonged, albeit with successive villages consumed by the ongoing sprawl process characterising urbanisation. In this case, it is sometimes via legal loopholes or even the corrupt practices of local authorities that individual investors or developers obtain planning permission for their activity.

The rapid development of individual housing construction in peripheral areas – as spurred on by Płock's favourable economic situation – led to the further expansion of the built-up area towards the north-east, and hence along the axis of the road linking Płock and Warsaw. It was in this way that Podolszyce was joined as a residential district by neighbouring gminas of Imielnica and Borowczyk (Czerny & Czerny, 2016).

Table 1
Changes in numbers of people per 1,000 inhabitants in Płock powiat in the years 2003–2016

Płock powiat	2003	2005	2010	2015	2016
Słupno	46.5	58.7	63.7	16.0	24.0
Stara Biała	20.7	26.7	38.7	13.1	12.1
Radzanowo	1.7	11.8	43.2	5.9	5.7
Łąck	0.8	8.3	27.7	1.1	3.5
Nowy Duninów	-2.6	-9.3	28.1	-4.3	3.5
Bielsk	-0.2	0.2	17.6	-3.3	-0.2
Gąbin – town	14.7	3.4	19.2	-8.9	-1.5
Staroźreby	-0.7	2.9	23.2	-9.1	-2.0
Gąbin	6.1	2.8	18.8	-4.0	-2.6
Gąbin – rural area	0.9	2.4	18.5	-1.2	-3.3
Płock	-0.5	-3.0	-14.8	-4.0	-3.6

Source: based on data from Local Data Bank (2018).

What is to be concluded from this table is that a process of outflow of population from Płock *sensu stricto* into neighbouring gminas began in 2005. In no other year in the period under study was it as intensive, in the face of a simultaneous increase in population in all of the gminas making up the powiat of Płock. The data presented also show how population increase is marked in gminas manifesting an intensive process or urbanisation. The gmina of Słupno borders on to Płock from the east (by the Warsaw road), while Stara Biała borders it in the NE, beyond Petrochemia.

In summary, the spatial structure of today's Płock and its suburban zone can be said to comprise four types of area from the physiognomic and functional points of view, i.e.:

1. A contiguous built-up area of the traditional kind of buildings originating in various periods, but subject to modification and modernisation for centuries (in the Old Town).

2. The petrochemical plants and associated blocks of large-panel construction built in the north-western part of the city.

3. The residential district coming into being in the 1980s (at the time of the peak role for central planning in the housing economy), with this taking a direction opposite to the petrochemical plants, i.e. in the direction of the south-east and east. Alongside multi-family blocks there were also single-family terraced houses on small plots of land.

4. A zone of suburbanisation in the context of a villa district, albeit of dwellings of varying standards (the larger the building plots, the further away from the city, with 1,000 m² reached and exceeded). The dominant direction is south-easterly, and along the national route to Warsaw. This phenomenon has been accompanied by partial degradation of the homes that went up close to the petrochemical works in the 1960s and 1970s.

Puławy

From the spatial development point of view, one of SE Poland's most interesting large towns/small cities is Puławy. This is a historic urban centre situated on the right bank of the Vistula which was once the seat of several leading aristocratic families in Poland (i.e. the Lubomirskis, Sieniawskis and Czartoryskis). In contrast, in communist times it was selected as the location for a large chemical plant. These two facts exert a marked influence on the development, fragmentation and functional and spatial structure of this large town, which only has around 50,000 inhabitants and can thus be regarded as a typical medium-sized urban centre. The development here was determined by the building (from 1961 onwards) of a large nitrogen works. From the outset, the workers needed to actually construct the industrial plant in the first place lacked accommodation, making it necessary for Puławy's physical development

to be planned for straight away. The assumptions at that stage were for the population to increase from the 13,000 observed in 1960 to 33,000 by 1970, and to 56,000 by 1985.

There was then a rapid implementation of projects involving the construction of housing estates comprising multi-family blocks of flats. The first occupants moved into Kaniowczyków I in 1963, and this proved similar to most of the developments of this kind from the communist era, in that the residential buildings were not accompanied into existence by other developments provided for on paper in urban-planning designs. Playgrounds, shops, health centres, kindergartens and so on were all absent.

According to Ałasa (2013, p. 45), in the 1970s it was possible to discern four directions to the expansion of built-up residential areas in Puławy:

1. The area of the old "Puławska Village" which had a major reserve of land already supplied with infrastructure. Adoption of this variant required the levelling of much of the single-family housing construction that had been present. It should be recalled that this whole project was put into effect in a manner that was (described by expert assessors as) disorderly, with the value of the project in both the technical and utilitarian senses being low.

2. The use of the "Allotment" plots (hitherto "frozen" by the aforementioned 1964 decision of the Voivodship Council).

3. The "Niwy" area – associated with a need to update the overall plan for the city and to make considerable outlays in order to supply sites with the necessary basic infrastructure. There was an obligation that protective zone 226 be maintained, and a blockade applying over a large area hosting special buildings and installations.

4. Land in the north of the city falling within the protective zone, in the ZDUNG woods and current municipal woodland park. This area came within the range of the sewer system, and was close to the combined heat and power plant.

Since 2000, it has been possible to note a clear process by which inhabitants transfer to the peripheries of Puławy from its centre (and hence out of crowded communist-era blocks and council flats that are degraded, having gone unrenovated for decades). Podgajna (2011, p. 67) showed how the years from the start of the 21st century were characterised by rather a steady trend for the numbers of people deregistering from Puławy – at a level almost twice as high as that characterising new registrations there.

In the case of Puławy over the 2003–2016 period, only the city itself noted an increase in population expressed per 1,000 inhabitants – of 8.1%. All other gminas in the wider powiat of Puławy experienced marked ongoing declines in population, which even exceeded 10% in the cases of Kazimierz Dolny, Dęblin and Sieciechów. The urbanisation process takes place within an extensive (50.5 km²) area of urban land which retains many free plots suitable for building, including in areas still used in agriculture (Local Data Bank, 2018).

Table 2

Numbers of people registering or deregistering in Puławy, 2001-2017

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Regis-tering	428	449	451	463	439	432	491	440	558	481	401	421	383	418	479	471	519
De-regis-tering	828	877	870	919	807	851	1000	823	758	822	596	578	697	601	296	569	309

Source: based on: Podgajna (2011, p. 67), Central Statistical Office (2018), *Lokalny program...* (2016).

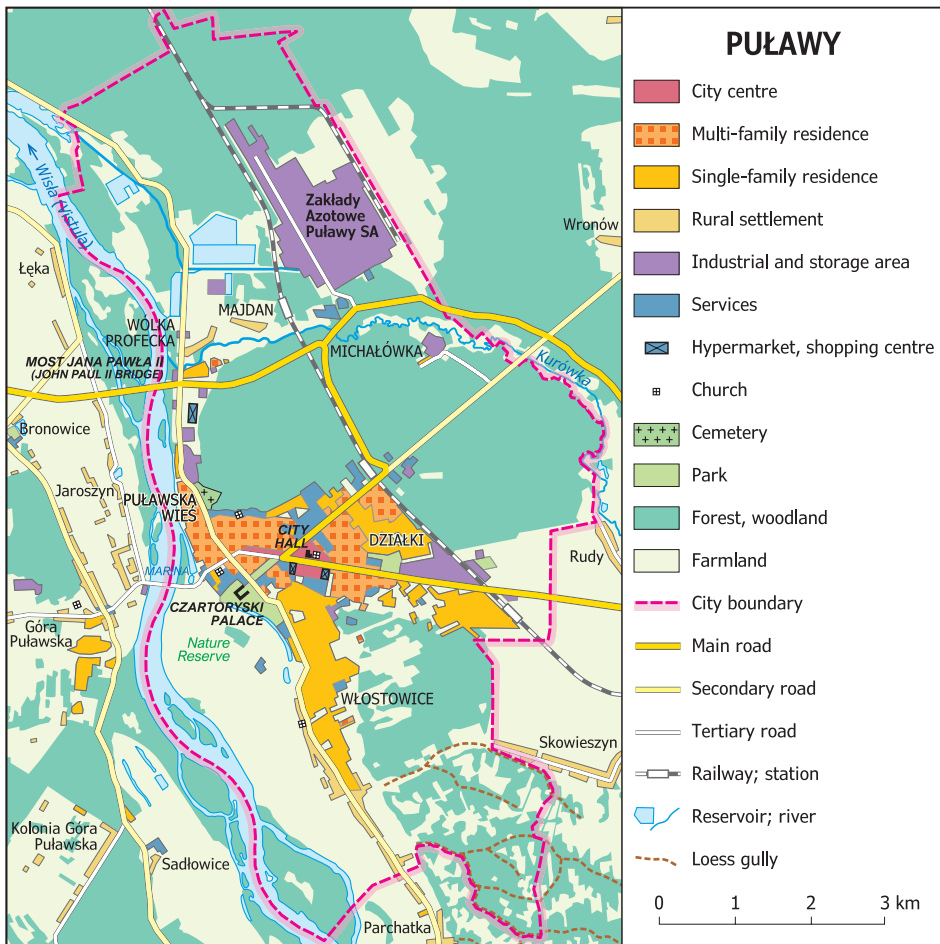


Fig. 2. The map of spatial expansion of urban area in Puławy

Source: based on Czerny & Czerny (2014, p. 161-191).

Within the gmina of Puławy as such, Gołąb and Góra Puławska are localities that have recently attracted the most new registrations of people. Gołąb is to the north of the city, while Góra Puławska is on the left shore of the island and is linked with Puławy proper via a river bridge. In the last decade built-up areas along Lubelska Street have been extending in the direction of Końskowola. All of this necessitates supplementation of ongoing spatial processes in Puławy as described by Alasa, to include:

- a process of suburbanisation manifesting itself in the development of estates of single-family housing in the direction of Lublin, with this being accompanied by a development of service functions including supermarkets, sales salons and so on;

- a process whereby the density to which land is built-up increases as new, multi-storey residential buildings go up in estates traditionally comprising villa-type houses (as the Działki or Allotments area).

Siedlce

The post-War development of Siedlce followed on from the locating of a large number of industrial plants here from the 1950s onwards. Prior to the War, Siedlce had resembled many other urban centres in this part of Poland in manifesting a rather diversified economic structure. Small factories and workshops were interspersed with a built-up area of high-density construction. While those buildings were mainly single-storey, two- or three-storey examples began to appear even pre-War. It was the parcelling-off of land that encouraged more major spatial change in the city in the period between the Wars. Siedlce was beginning to develop in a northerly direction, with the so-called "Nowe Siedlce" residential district taking shape, and comprising single-family housing. This was actually the first such district entirely given over to the residential function, and it rather lacked morphological linkage with the earlier fabric of the city. This was therefore a departure from the traditional model entailing contiguous urban construction (Wróbel, 1971). It was in turn down to unfavourable environmental conditions for building that expansion of the city's built-up area in all other directions proved far less dynamic.

Change in the post-War period was sufficient to produce an overall change of image and structure through the city as a whole. As one of eastern Poland's key centres, Siedlce was now slated for development into an industrial city. The 1950–1955 period first saw the private factories referred to above closed down, by way of a consolidation into labour cooperatives primarily exemplifying light industry. However, the economic plans being pursued by the authorities of the Communist Party anticipated Siedlce changing far further – into the main economic centre anywhere in the Podlasie region. This meant location – at what were then the edges of the city – of a Northern and a Southern Industrial

District. This move further anticipated an influx of immigrants seeking work, and hence the construction of major housing estates close to the industrial zones (Kospath-Pawłowski, 2007).

As of 1957, the main plants comprising industry in Siedlce were Przedsiębiorstwo Jajczarsko-Drobiarskie (a poultry and egg-producing enterprise), and Zakłady Przemysłu Spirytusowego (distilling spirits). Needless to say, the 1955–1965 period saw that short list augmented, as industrialisation policy was pursued further, also in line with a process deliberately intended to ensure economic activation in urban centres of small or medium size. Plants, mills and factories erected at this stage were those of Zakłady Przemysłu Dziewiarskiego „Karo” (timber industry), Siedleckie Zakłady Drobiarskie (poultry again), Zakłady Zabawkarskie (toy manufacturing), Zakłady Zbożowo-Młynarskie (cereal milling), Zakłady Mechaniczne im. M. Nowotki (manufacturing) and Siedleckie Zakłady Przemysłu Terenowego (various) (Biarda, 2001). In 1968, work began on building yet another factory – this time connected with the manufacture of electrical machinery, and located in the southern industrial and warehousing district. Such efforts combined to turn Siedlce into a significant centre of industry, and a key node in the transport network (Koc, 2015). However, all of this time, the population had continued to concentrate in the traditional, historical part of the city.

Single-family housing construction once predominated in the suburbs of Siedlce. It was on the Nowe Siedlce, Stara Wieś and Warszawskie estates that the greatest numbers of inhabitants lived. However, from the 1970s onwards, estates with multi-family residential blocks began to arise. 1975 then saw the establishment of a voivodeship (province) of Siedlce in the context of Poland's amended administrative division, and this fact encouraged the development of the aforementioned southern industrial and warehousing district. Almost 3,000 new dwellings came into existence in the 1970–1975 period, which is to say a number three times greater than between 1965 and 1970 (Koc, 2015, p. 35). It was mainly 5- or 11-storey residential buildings that were put up.

Nevertheless, from the 1970s onwards, shortfalls in municipal management were sufficient to apply brakes to the development of Siedlce. For example, as of the late 1970s, only just over 50% of inhabitants were connected to the sewer system (Koc, 2015, p. 36). Furthermore, rapid development of construction failed to meet the demand for housing on the part of a population originating in rural areas that was now flooding into the city.

The 1980s brought further intensification of the process putting multi-family housing in place. Whole new estates came into being, along with new buildings in estates already existing. 627 plots of building land were designated for single-family housing and, while 245 of these were given over to the city to manage, 382 remained with their former owners. However, while the number of dwellings constructed did increase rapidly, a large proportion of all inhabitants continued to wait for flats to be assigned to them – not merely on the municipal

side, but also in respect of cooperative housing (Kospath-Pawłowski, 2007). The main cause of this state of affairs was a shortage of funds for the extension of necessary infrastructure into areas slated for development (Koc, 2015, p. 37).

As of the 1960s, areas under housing construction accounted for 14% of the entire area of the city. The next 20 years saw this figure rise by 18%. Initially, housing construction was concentrated in the city centre, but from there it passed along streets radiating out. Dwellings in the nature of smallholdings were located furthest out from the centre. However, in the early 1990s, built-up areas of a residential profile began to spill over from central Siedlce. New housing estates much further removed from places of work likewise began to appear. At the same time, there was a marked increase in numbers of new dwellings located in the immediate vicinity of the city's industrial plants (Koc, 2015, p. 38).

It was southern and northern areas on the edges of the city that were designated for industry. The Southern District developed thanks to a convenient location close to the Warsaw–Terespol road. In turn, in the Northern District, the industry present was associated with agriculture and food. As of 1965, the area contained within the city limits was still far smaller than today. Yet at that point, more than 76% of the whole area of the city still comprised agricultural land. The built-up or urbanised share of the city was then 22%. Today, the situation is the reverse, with 58% of the city now urbanised, while farmland of different kinds takes in 34% (Koc, 2015, p. 47). There remain certain areas developed residentially in which reserves of building land are present, though these are typically now peripheral areas. Equally, the city-centre district, though already the most-urbanised part of Siedlce, retains some free land that can be built on with either housing or service premises. The industrial district still has considerable reserves of land, albeit with business designations (Koc, 2015, p. 48).

Table 3

Changes of population per 1,000 inhabitants in Siedlce powiat in the years 2003-2016

Gmina (local-authority area)	2003	2005	2010	2015	2016
Siedlce (2)	9.4	11.1	26.0	7.0	19.5
Suchożebry	-4.5	-6.9	23.1	-11.4	8.3
Kotuń	-2.4	-3.8	11.6	-5.6	7.1
Skórzec	-4.8	3.0	27.7	2.1	3.8
Zbuczyn	-3.4	-2.9	14.9	2.5	2.9
Siedlce (1)	3.0	0.5	-13.3	4.4	1.0
Wiśniew	0.3	0.3	4.1	-3.4	-1.2
Mordy – rural area	-13.8	-21.5	6.6	-3.6	-7.1
Mordy	-10.9	-14.2	9.0	-1.3	-9.2
Mokobody	3.2	-7.1	-9.8	-0.8	-13.6
Mordy – town	-3.8	4.4	14.7	3.9	-13.9

Source: based on data from Local Data Bank (2018).

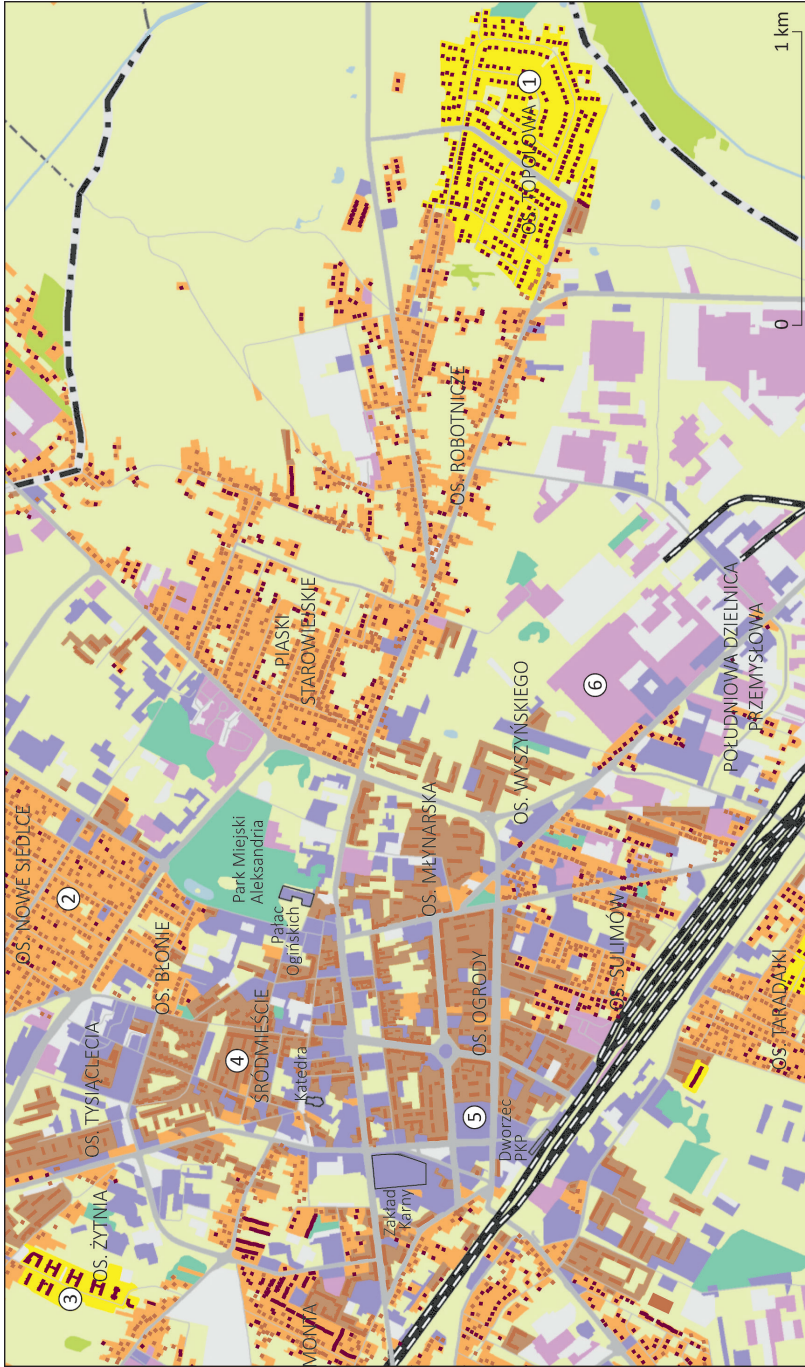


Fig. 3. The map of spatial expansion of urban area in Siedlce illustrating the processes of spatial expansion of buildings
 1 – remaining single-family housing, 2 – new multi-family housing, 3 – remaining multi-family housing, 4 – new multi-family housing, 5 – service areas, 6 – industrial areas
 Source: Koc (2016) actualized and changed by A. Czerny (2018).

Today's Siedlce remains a rather small urban centre of 76,000 inhabitants. The spatial development that is occurring takes place along an east-west axis, with two smaller branches off to the north (along the commercial axis to the industrial district) and to the north (the axis of residential development slightly skewed to the south – where large areas of industrial land remain). As data in the table make clear, since 2010 the population in the gminas surrounding Siedlce has grown markedly, giving support to a thesis regarding suburbanisation processes to be observed in the city.

Summing up:

- over the 50 years, there have been no changes to city limits, even if there have been marked changes in land-use structure within those boundaries. However, through to the 1990s, the spatial development of urban functions did not entail more major change in their distribution across the city;

- from the point of view of functional/spatial changes, those achieving greatest intensity characterised former industrial areas, with abandoned industrial buildings starting to play host to services, while some industrial sites are redesignated for housing;

- the main axis to spatial development runs towards the north and east.

Summary – between the consolidation of cities' internal structures and restructuring

With the ushering-in of far-reaching systemic change in Poland, 1990 brought new phenomena and trends where the physical development of the country's cities was concerned. Analysis of the dynamics to changes ongoing from 1990 through to the present day in a small number of selected towns and cities allowed for the presentation of certain general tendencies considered characteristic of the overall process of functional and spatial transformation taking place.

In fact, overlapping processes present in the urban space of medium-sized urban areas are seen to be rather varied in nature. On the one hand, it is possible to discern certain generally-observable phenomena also (perhaps above all) characteristic for Poland's largest cities, while on the other there are certain "provincial" features of development taking place, which entail the copying of rural forms of building and functional structure by the inhabitants of suburban areas.

Characteristic contemporary phenomena present in large cities include urban sprawl into rural areas, and hence the occupying of formerly agricultural land by residential construction meeting the needs of what were formerly city-dwellers; the spread of built-up areas beyond the contiguous construction of this kind typical for the city proper; and finally a certain socio-spatial segregation whereby enclaves of single-family housing take shape, with this being of higher standard,

though co-existing alongside homes typical for the countryside or the small town. The list may also be extended to include problems relating to pollution (i.e. a build-up of household refuse that quite often seems to be fly-tipped illegally, as well as the pollution of surface waters and other phenomena).

While such features might typically be ascribed to the process of metropolitanisation, they are also seen to be present in the three urban centres of medium size reported on here.

The process by which urban structure is transformed is also characterised by different phases, from the traditional town shaped pre-War (in fact far earlier in the cases of the three centres under study) through to the post-transformation town or city. The contemporary depictions of these cities' internal structures prove highly diversified. Elements to the internal mosaic take the form of different architectural styles, different materials used in building homes from the different periods, and now also differences in terms of social structure that did not manifest themselves in the communist era. Spatial development obviously conforms with natural conditions that relief, vegetation and the hydrological network supply. Industrial zones dating back to communism operate like poles of growth drawing in new labour force from nearby rural areas. And the industrialisation achieved deliberately through the locating of large plants gave rise to multi-family block housing estates that themselves made a start to new urban-planning forms in built-up areas. In all three cases studied, the locations for housing estates in which industrial workers were to live were selected in line with their being in the immediate vicinity of the works, plants and factories themselves. In this way, first axes of development were generated – leading from the historic centre and old pre-War construction in the direction of the new centres of industry. The first wedges of development within the functional and spatial structure took shape in this way.

In the cases of Płock and Puławy, it is possible to sketch out a scheme for the spatial development of two very much extended arms (wedges), as well as several less-distinct axes of development running out from the centre. Siedlce in fact has a highly regular development scheme with four arms much extended and leading out from the centre towards the periphery. However, the further development of these was not brought about by industrialisation, but rather by a change of leading function in the direction of a prevalence of services and a reversal of spatial expansion from a direction associated with industrialisation in the opposite direction, given the search by the new middle and upper-middle classes for sites to build single-family housing ultimately to be enclosed within closed (“gated”) housing estates. In all three large towns/small cities studied, this trend is strengthened by the locating of most main shopping centres along the axes of communication running through the new villa district (Czerny, 2013).

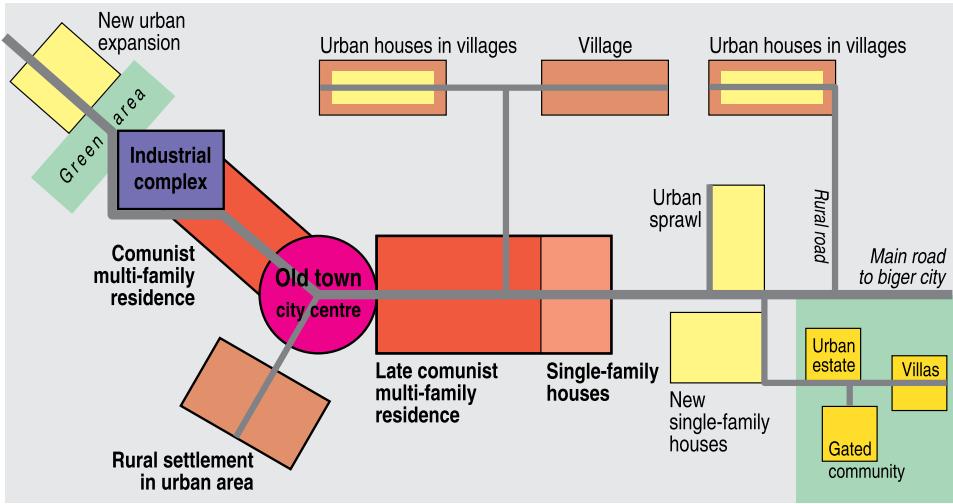


Fig. 4. The single-axis model depicting the functional/spatial structure of medium-sized urban centres
Source: own study.

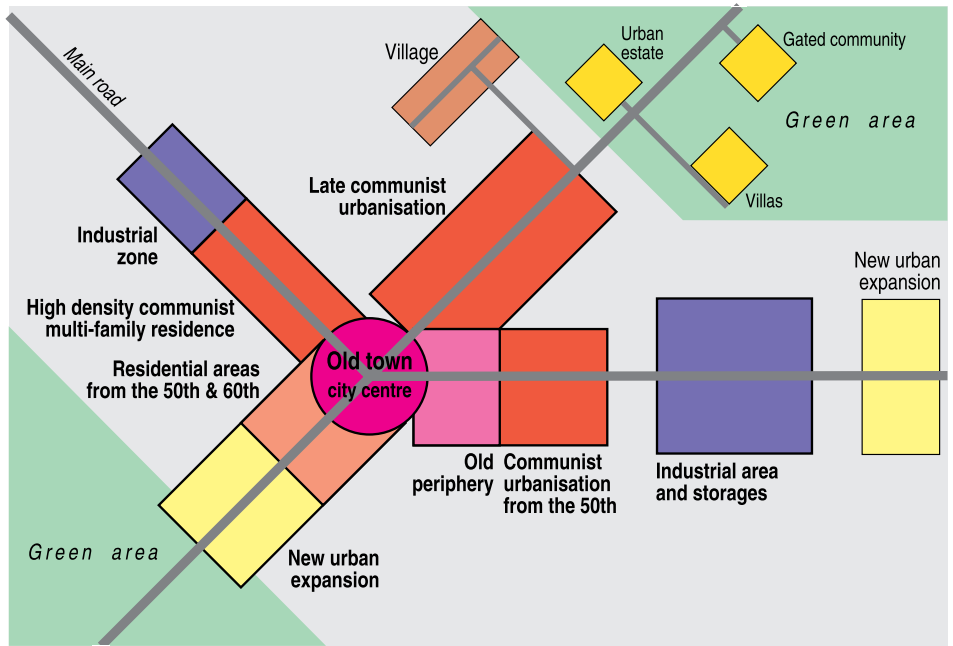


Fig. 5. The dual-axis model depicting the functional/spatial structure of medium-sized urban centres
Source: own study.

Progressing trends entailing the spatial expansion of urban construction into rural areas ensure that the latter are the subject of positive migration balances. There are thus demographic changes taking place – above all increases in the share of the population that is of productive or pre-productive age. Main economic changes in turn entail the development of functions outside agriculture, with the rule being for diversification of economic activity to be greater and greater the closer to the city limits one moves. In the case of the medium-sized urban centres under study, the investment booms to be noted on the peripheries are as visible as those characterising the large cities. The said booms are manifested in both increased housing construction (be it single- or multi-family) and a rise in the number of firms representing branches of the economy outside agriculture, primarily small-scale manufacturing and services. However, the development of the technical infrastructure that facilitates these processes still mostly takes place with a time delay in relation to the first new housing and business developments.

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References

- Alasa, R. (2013). *Rozwój infrastruktury miejskiej oraz zmiany warunków życia ludności Puław w latach 1961–2008*. Maszynopis. Warszawa: WGSR WU.
- Bański, J. (2007). *Małe miasta – lokalne centra rozwoju obszarów wiejskich*. Materiały z konferencji „Obszary wiejskie jako wyzwanie dla polityki rozwoju w Polsce”. Retrieved from www.mrr.gov.pl/.../documents/ca81f5eaf61b4809aa3b3541c7ee9f8606 (3.07.2013).
- Barbier, B. (1985). Strefa podmiejska i przestrzeń podmiejska w geografii francuskiej. *Acta Universitatis Lodzianensis, Folia Geographica*, 5.
- Biarda, M. (2001). Rozwój gospodarczy miasta Siedlce w latach 1975-1989. *Szkice Podlaskie*, 9, 22-48. Central Statistical Office. Retrieved from <http://demografia.stat.gov.pl/bazademografia/Tables.aspx> (07.02.2018).
- Czerny, A., & Czerny, M. (2014). *Suburbanization or Chaotic Encroachment upon Agricultural Land within Poland's Small and Medium-sized Towns, as Exemplified by Puławy*. In M. Czerny & G. Hoyos-Castillo (Eds.). *Suburbanization versus Peripheral Sustainability of Rural-Urban Areas Fringes*. New York: Nova.
- Czerny, A., & Czerny, M. (2016). *Suburbanization in a medium-sized city, as exemplified by Plock, central Poland*. In M.V. Santana-Juárez, G. Hoyos-Castillo, G. Santana-Castañeda, N.B. Pineda-Jaimes & H. Campos-Alanis (Eds.). *Desafíos de las metrópolis: efectos ambientales y sociales. Tendencias geográficas II*. Toluca: UAEM.
- Czerny, M. (2005). *From city periphery to urban sprawl – world experiences*. In M. Gutry-Korycka (Ed.). *Urban Sprawl. Warsaw Agglomeration*. Warszawa: WUW.
- Czerny, M. (2010). *Ciudad difusa: El objeto de estudios geográficos comparativos*. In F. Cebrián Abellán, F. Pillet Capdepón & J. Carpio Martín (Eds.). *Las escalas de la geografía: del mundo al lugar*. Cuenca: Ediciones de la Universidad de Castilla-La Mancha.
- Czerny, M. (2014). *Stare i nowe w przestrzeni miast Ameryki Łacińskiej. Aktorzy i kontestatorzy zmian*. Warszawa: WUW.
- Czerny, M., & Czerny, A. (2009). An emerged new centre of Warsaw, Poland. *Current Politics and Economics of Europe*, 20(2/3), 193-223.

- Czerny, M., & Czerny, A. (2013). *La Ciudad de Plock y el proceso de difusión urbana en la realidad de Polonia*. In F. Cebrián Abellán & M. Panadero Moya (Eds.). *Ciudades medias. Formas de expansión urbana*. Madrid: Biblioteca Nueva/Grupo editorial XXI.
- Göbel, Ch. (2015). *Una visión alemana de los modelos de ciudad: El caso de Querétaro*. Retrieved from <https://editorialrestauro.com.mx/una-vision-alemana-de-los-modelos-de-ciudad-el-caso-de-queretaro/> (2.02.2018).
- Informal City. Caracas Case*. (2005). A. Brillembourg, K. Feireiss & H. Klumpner (Eds.). Munich, Berlin, Londres, Nueva York: Prestel Verlag.
- Koc, M. (2015). *Zmiany przestrzenno-funkcjonalne w Siedlcach w okresie transformacji*. Praca magisterska. Warszawa: WGSR, UW.
- Koc, M. (2016). *Analiza kartograficzna procesów suburbanizacji i eksurbanizacji na przykładzie miasta i gminy Siedlce*. Lublin: Zakład Kartografii i Geomatyki UMCS.
- Local Data Bank. Retrieved from <https://bdl.stat.gov.pl/BDL/start> (22.02.2018).
- Lokalny program rewitalizacji miasta Puław do roku 2020 z perspektywą do 2030 roku*. (2016). Puławy: Urząd Miasta.
- Malisz, B. (1966). *Metody analiz geograficznych w planowaniu przestrzennym*. Warszawa: PAN.
- Mantey, D. (2011). *Żywotowość lokalizacji osiedli mieszkaniowych na terenach wiejskich obszaru metropolitalnego Warszawy*. Warszawa: Uniwersytet Warszawski, Wydział Geografii i Studiów Regionalnych.
- Montpellier, la ciudad mediterránea de futuro*. (2012). *Mobilitat Sostenible i Segura*, 60. Retrieved from <https://transportpublic.org/images/pdf/mss60-cas.pdf> (07.02.2018).
- Panadero Moya, M. (2009). *Manifestaciones finiseculares del proceso de urbanización en ciudades medias de entornos culturales diferenciados*. Maszynopis. Albacete: Universidad Castilla-La Mancha.
- Podgajna, K. (2011). *Tendencje rozwoju przestrzennego średnich miast na przykładzie Puław*. Maszynopis. Warszawa: WGSR UW.
- Schnellwachsende Mittelstädte in Mexiko*. (1994). M. Einsele, E. Gormsen, E. Ribbeck & R. Klein-Lübke (Eds.). Stuttgart: Instituto de Urbanismo de la Universidad de Stuttgart.
- Siedlce 1448-2007*. (2007). E. Kospath-Pawłowski (Ed.). Siedlce: Wydawnictwo Akademii Podlaskiej.
- Stöhr, W. (1975). *Regional development: experiences and prospects in Latin America*. The Hague: Mouton.
- Straszewicz, L. (1985). Strefa podmiejska. Pojęcia i definicje. *Acta Universitatis Lodziensis, Folia Geographica*, 5, 7-16.
- Wróbel, T. (1971). *Zarys ogólny budowy miast. Siedlce*. Wrocław-Warszawa-Kraków-Gdańsk: Zakład Narodowy im. Ossolińskich.