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Local centres in post-socialist suburbs: Redefined concept and retrofitting perspectives

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Abstract:

Chaotically developed post-socialist suburbs need retrofitting by providing residents with a local central space. This research aims at developing a typology of suburban local centres, describing the most common central spaces according to adopted criteria, as well as identifying which type of local centre has the most potential to be perceived as such by suburbanites and how suburban municipalities plan central spaces. The research was conducted in six institutional Warsaw suburbs representing the most common types of local centres of a neighbourhood catchment area. The research has shown that spatial criteria differentiate local centres more than social criteria. Concentric layouts attract different non-residential functions more effectively than linear ones. When recognising some spaces as central, the legibility of the broader spatial arrangement and the presence of key objects with centre-forming functions seems to be important. Factors that distort such recognition include the excessive dispersion of buildings, shops, and service points; peripheral or random location of the main activity node; poorly designed and equipped central spaces; and the proximity to large-scale shopping centres and recreational areas/objects. When looking for a model of retrofitting post-socialist suburbs through strengthening neighbourhood centres, it is worth recalling the concept of the so-called "third places".

Keywords: *local centre, neighbourhood, suburbs, retrofitting. Warsaw, Poland*

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1. Introduction

After the rapid suburbanisation in post-socialist Europe in the 1990s, which was well recognised and described in the literature (Tsenkova and Nedović-Budić, 2006; Sýkora and Ouředníček, 2007; Pichler-Milanović et. al., 2007; Tammaru et al., 2009; Hirt, 2012; Stanilov and Sýkora, 2014; Dinić and Mitković, 2016; Taubenböck et al., 2019), a new need has emerged, namely retrofitting chaotically developed suburbs. It is a response to negative connotations of urban sprawl, such as irrational spatial structures, dispersion, cultivating auto-dependence, disproportionately depleting energy, land, and water resources, social isolation, mono-functionality, a considerable proportion of gated communities, and the lack of planned public spaces (Zuziak, 2005; Chmielewski, 2005; Zimnicka and Czernik, 2007; Mantey, 2011; Springer, 2013; Solarek, 2013; Kępkowicz and Mantey, 2016).

The only feasible way to make post-socialist suburbs more sustainable is treating them as defective neighbourhood units that need to be reinforced by improving their compactness (Mantey and Pokojski, 2020) and overcoming mono-functionality. In contemporary planning theory, a polycentric spatial structure or deconcentration of non-residential functions in the whole city region are promoted. As a consequence, there are many different types of suburban central spaces increasingly finding new locations on the outskirts of big cities, including exhibition, logistic, office, industrial, and technological centres. Apart from supralocal concentrations of functions, there are also activity nodes of a neighbourhood catchment area. This type of central space fulfils the everyday needs and organises the local life of the community.

In this context, two terms seem to be of special importance: neighbourhood and local central space. When reviewing different definitions of a neighbourhood, Park and Rogers (2015) synthesise them into a statement that a neighbourhood is a collection of people who share services and some level of cohesion in a geographically bounded place. Thus, there are three keywords defining neighbourhoods, namely people, place, and cohesion. Local centre (LC), in turn, can be defined broadly as a multifunctional public space providing access to basic (everyday) services, but also favouring social integration and building the territorial

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identity of the residents (Damurski et al., 2018), or shortly, as a hub of activity (Dinić and Mitković, 2016). A properly developed community centre is one of the most powerful urban design elements to achieve social sustainability at the neighbourhood scale, because of its importance to, influence on, and positive social externalities towards the local community (Medved, 2017). Because the terms "neighbourhood" and "community" are sometimes interchangeable concepts, the "neighbourhood centre" often becomes synonymous with the term "community centre" (*ibidem*).

The need for more local life in the neighbourhood is in line with the climate change context of sustainability and the need for radical solutions when tackling this problem. Besides, the idea of decentralised, compact, mixed use neighbourhoods have become more apparent due to the Covid-19 pandemic (O'Sullivan, 2021). As more people work remotely and want to live further away from the city centre, certain planning concepts have re-emerged.

Taking these changes into account, the aim of the article is threefold:

1. To develop a typology of LCs based on the criteria that refer to the concept of a neighbourhood unit;
2. To identify whether LCs determined in accordance with the typology are perceived as such by the residents (the research is based on selected Polish suburbs – see Fig. 1);
3. To recognise the approach of suburban municipalities towards planning LCs.

As a result, this paper should contribute to the development of the model of retrofitting Polish suburbs through reinforcing neighbourhood local centres. This reinforcement will draw from the critique of the neighbourhood unit concept and the basic principles of designing the central space. The typology based on universal criteria as well as the general recommendations of how to retrofit Polish suburbs, can be used in other post-socialist countries as well, since the origins of different types of suburbs in this part of Europe are to some extent similar, although the pace of suburban transformations varies (Ouředníček, 2007; Zębik, 2011; Dinić and Mitković, 2016; Mantey and Sudra, 2019; Zévl and Ouředníček, 2021).

2. Theoretical background: central space in the context of suburban neighbourhoods

In the context of chaotically developed post-socialist suburbs and the need to retrofit them, the concept of suburbs as imperfect neighbourhoods is worth implementing. Taking into account different spatial scales in which neighbourhoods can be considered (Park and Rogers, 2014) and the conditions for creating suburban central space, which is a key element in the retrofitting process, the 'institutional neighbourhood' seems to be the most suitable spatial scale for further considerations. The American Planning Association (2006) emphasises that an institutional neighbourhood is bounded by some degree of official limits of institutions. It needs to be big enough to provide multiple services such as schools, health centres, recreational and social facilities, and shopping centres (Park and Rogers, 2015). The spatial scale of institutional neighbourhoods is appropriate for the public sector to be involved in land use planning, transportation, economic development, open space and social services provision, commercial revitalisation, meeting residential needs or environmental issues. It also enables conducting statistical analysis since administratively distinct settlement units are often the lowest level of data collection (Airgood-Obrycki, 2019).

In the process of retrofitting suburbs, finding appropriate and feasible ways to increase density without negative effects is relevant for current planning discussions (Talen, 2009). From the viable neighbourhood and social sustainability perspective, the location of basic public facilities, such as schools or shops, is of particular importance. When achieving social goals at the neighbourhood scale, properly developed neighbourhood central spaces that enhance walking and strengthen local ties is one of the most powerful urban

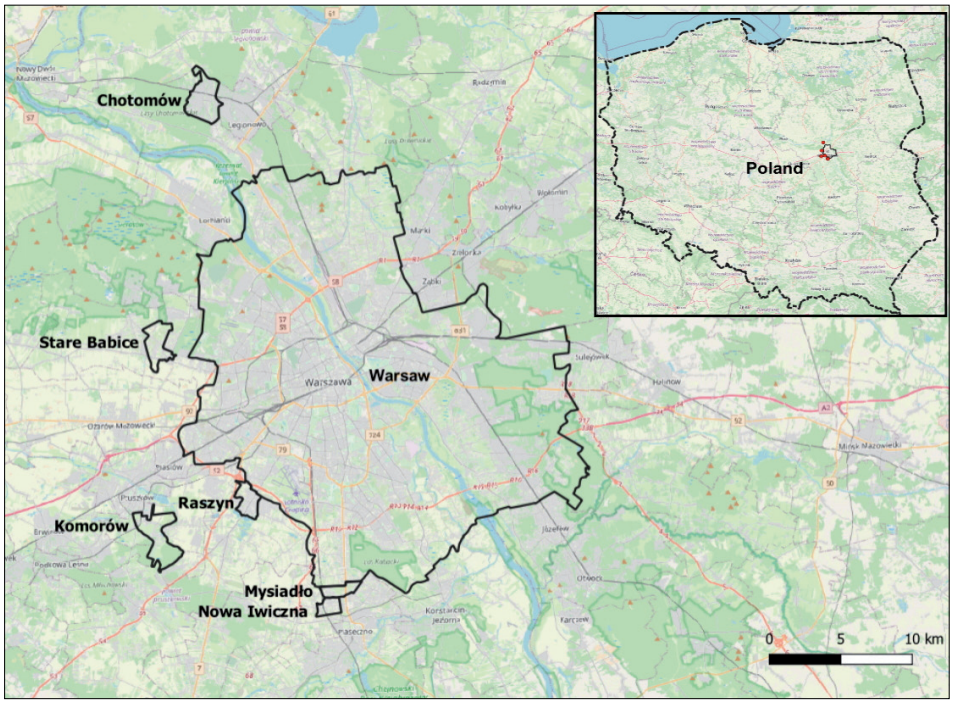


Fig. 1: Suburbs selected for the study
Source: Wojciech Pokojski; used with permission

design elements. The concept of a "centre" is considered in two dimensions: functional and spatial. In the functional dimension, the centre is identified with a small area where various functions and activities are concentrated, while the spatial dimension denotes a specific position of a given area in the structure of the settlement unit as a whole (Hillier, 1999) – the centre structures the urbanised area and gives it meaning (Jałowiecki and Szczepański, 2006). Taking into account the spatial dimension, the suburban centre can be related to the concept of nodes of K. Lynch (1960). Nodes are represented by road intersections, public transport stops or concentrations of retail and service points. A legible, specific layout of the node is not necessary for its recognition, although a well-developed node that stands out from the surroundings is more easily perceived by the residents as a central space.

If we consider the leading function, two types of central space can be distinguished: (1) commercial centre and (2) community centre. The second type is closely related to C. Perry's (1929) concept of the neighbourhood unit that organises the space around a community centric lifestyle and pushes away heavy traffic as well as local shopping areas to the edges of the socio-spatial entity. Its critique, however, raises the issue of separation of the neighbourhood unit that leads to segregation by function, and provides very poor access to essential services and destinations, although it protects residential neighbourhoods from disruptive traffic (Mehaffy et al., 2015). The modified concept of central space based on transit through the neighbourhood unit could be a response to this criticism. Community services and shops reinforce each other most effectively when they are spatially associated with the main street – "movement economy" (Porta et al., 2012), while in Perry's concept, community services are located in the very centre of the unit and shops on its edges. Moreover, by not centring neighbourhoods on arterials or main crossroads, they cannot be serviced cost-effectively by public transit (Poticha, 2008, after: Mehaffy et al., 2015).

In terms of spatial scale and location, there are two main categories of suburban centres. The first one is represented by the concentration of large-scale objects gathering all the functions of the high street under one roof (Hardwick, 2004) and targetted at the residents of both the city and the suburban areas: big box stores, multiplex cinemas, and large supermarkets. These objects are located on the edges of settlement structures or at some distance from them, alongside the main transportation routes and nodes, at visually exposed sites, as an adaptation of land uses to expanding catchment areas of such suburban centres. There is usually no public space that would bind together land parcels on which particular objects are situated, so they do not promise developing any proper links or relations with their surroundings in the future (Bajwoluk, 2015). This spatial form is characteristic of the North American suburbs. Many such big-box complexes, however, have undergone intensive modernisation processes in recent years (Dunham-Jones and Willianson, 2009; Tachieva, 2010; Marique, and Reiter, 2014; Talen, 2015). Car-oriented shopping malls, as described above, have been turned into multi-functional walking- and public transit-conducive centres.

The second main category of suburban centres represents a neighbourhood catchment area and take the form of a cluster of a few non-residential functions at a distance of no more than 100 m from each other (parameters according to Mantey and Pokojski, 2020). The set of units of non-residential function includes schools, places of religious worship, small scale service and retail premises, local administration offices and cultural objects. Such a centre is typical of old suburbs with the preserved compact development structure, which do not easily yield to transformations or accommodate new spatial solutions. When reviewing the literature on suburban local centres, the research on utility programs of suburban high streets are noteworthy (Gryffiths et al., 2008). Interestingly, the viability of suburban centres located along high streets is not determined solely by trade. It tuns out that most people visiting suburban centres choose them for reasons other than shopping, and the vitality of such places depends, on the one hand, on the degree of diversification of activities that can be undertaken there, and on the other hand, on the location of the centre in the system of residents' routes and in the system of transport connections (Hillier, 1999; Vaughan and Gryffiths, 2013). There is also research on pedestrian traffic and its importance in the context of the vitality of suburban central spaces (Boarnet et al., 2011; Vaughan and Geddes, 2014).

In the process of densification of suburban settlements, infill and redevelopment strategies of reinforcing local centres can be used. Infill strategy aims at implementing new non-residential functions to vacant sites. Although the strategy seems to be simple in its assumptions, its implementation may encounter many barriers, like the cost of land acquisition, regulatory restrictions, and neighbourhood groups opposing the introduction of non-residential functions (Farris, 2001). Redevelopment strategy, in turn, suggests a comprehensive improvement of existing urban structures with the involvement of developers' capital (Talen, 2011, 2012). The United States is a good example of a country where this strategy is being implemented successfully, although redevelopment is difficult to accomplish in fully-developed suburbs (Scheer, 2001). Due to zoning regulations (Hirt, 2013) and the reluctance of American suburbanites to locate anything other than housing in their neighbourhood, many retrofitting projects based on multi-functional centres cannot be implemented in the existing suburbs. American urbanists, however, were the first to suggest re-developing, re-inhabiting, or re-greening "dead" shopping malls or commercial corridors based on New Urbanism principles (Dunham-Jones and Wlliamson, 2009; Tachieva, 2010; Talen, 2015). These principles are also visible in mixed-use settlement units with local centres, which take the form of new towns (e.g. Serenbe) or rebuilt and extended old ones along the railway lines (e.g. Duluth, Suwanee, and Norcoss, near Atlanta). Despite quite different contexts of suburbanisation (large-scale developers' greenfield projects and high intensity of deconcentration processes), American retrofitting projects may provide some inspiration in the search for better solutions to be adapted in post-socialist transformations, namely: spatial scale, location, social-mix, the range of functions, quality of urban and architectural projects, and the engagement of developers' capital.

3. Data and methods

The search for opportunities to make Polish suburbs more sustainable has been preceded by the development of a typology of suburban local centres (LC) with commercial and social functions. The criteria of a new typology are based on the literature review. They refer to the criticism of C. Perry's (1929) concept of a neighbourhood unit, and reflect to some extent new issues under debate: social and economic diversity, maintenance of viable pedestrian and public transit

modes, viability of internalised community service hubs, and efficient use of energy and natural resources (Mehaffy et al., 2015).

Urban layout, form and location of a local centre seems to be conditional for its economic vitality, while civic and commercial uses concentrated on a relatively small area enhance walking and stimulates local life. These assumptions make the foundations for the typology which is based on four categories of criteria: (1) catchment area, (2) spatial form, (3) functions, and (4) location (Bajwoluk, 2015). They correspond with the two dominant models of suburban development in post-socialist Europe:

1. New development in the form of scattered mono-functional settlements on former agricultural land, adjacent to the existing urban fabric or completely independent of it (Tammaru et al., 2009, after: Dinić and Mitković, 2016);
2. Infills and small spatial extensions of existing settlements (Zévl and Ouředníček, 2021).

These two models of suburban development create different conditions for the retrofitting post-socialist suburbs. The typology presented in this article is intended to facilitate the description of local centres and draw attention to their retrofitting potential, hence the focus was rather on justifying the typological criteria than providing examples of all possible types of LCs, especially as we do not know if all the types exist (this may be the subject of further research).

3.1 Catchment area

Catchment area is of primary importance. It determines the remaining criteria of the typology. Multifunctional walking- and public transit-conducive centres can be developed at three scales: (1) the neighbourhood, (2) the municipality, or (3) a quadrant of the metropolitan region (Filion et al., 2016). In opposition to the process of retrofitting North American suburbs that usually focuses on large multifunctional suburban centres (Dunham-Jones and Williamson, 2009), this article suggests the neighbourhood scale of transformation as the most conducive to local community building. Therefore, the typology is dedicated exclusively to the neighbourhood catchment area. The other two scales have been omitted.

3.2 Spatial form

The criterion described as spatial layout in which the LC is embedded reflects the basic street framework that determines the concentration of services. Spatial arrangement can be easily identified by visual inspection of satellite images provided by the Google Maps or Google Earth applications. The typology distinguishes three main spatial layouts:

1. Concentric layout – services concentrated around a common space or a point, where the main roads converge;
2. Linear layout – services located along main road or its section;
3. Scattered layout – a single multifunctional object or a few objects of non-residential functions located within a quarter of streets that do not form a centripetal system.

In all these layouts, commercial and public objects are located at no more than 100–130 m from each other (Mantey and Pokojski, 2020). Bajwoluk (2015) adds one more type of the LC, namely a large-area centre. This category, however, is dominated by supermarkets and big-box service facilities with external parking lots. Due to the neighbourhood scale of local centres under study, this type was not included in the typology.

The location of a LC within the spatial arrangement of the suburb and the network of streets determines walkability and the ease of access for the majority of residents, and thereby translates into the economic vitality of the central space. Identified spatial layouts of LCs enable a description of various types of post-socialist suburbs and suburban housing: new residential developments, core-village suburbs, old suburbs modelled on garden cities, and transformed recreational summer cottages (Ouředníček, 2007, Hirt and Stanilov, 2007). The concentric layout (Fig. 2) is more common in planned garden-cities and core-village suburbs. The linear layout (Fig. 3) is typical for the suburbs that spread along the main road, which during the transformation period has become a natural space for locating non-residential functions. Scattered layout (Fig. 4) often accompanies new suburbs characterised by developers' housing estates and a network of parallel roads linked by perpendicular connectors (in Poland, this layout refers to the unfavourable spatial structure of previous rural land), or represents older settlement units (often former rural village) with a grid street scheme.

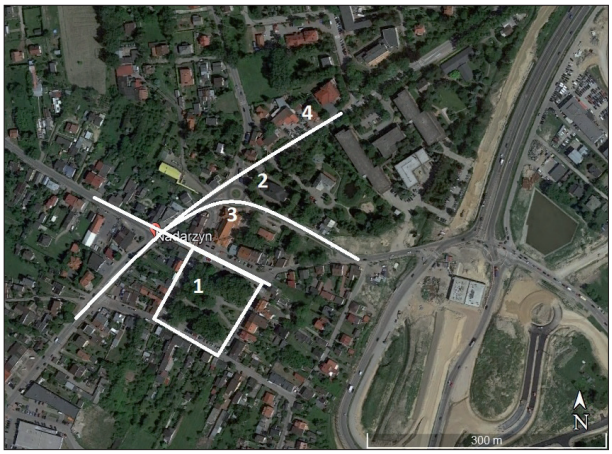


Fig. 2: Example of concentric layout of LC in Nadarzyn, Poland (main objects: 1 – green square, 2 – church, 3 – library and community house, 4 – police station)
Source: Google Earth Pro, 22 June 2022



Fig. 3: Example of linear layout of LC in Jesenice, Czech Republic (main objects: 1 – square, 2 – municipal office, 3 – supermarket, 4 – police station)
Source: Google Earth Pro, 22 June 2022

The second criterion reflecting spatial form of the LC is the type of nucleus/core around which the central space was developed. Based on the seven forms of the LC's core identified as part of a project aimed at creating a network of local centres in Warsaw (Happach and Sadowy, 2015), the typology presented in this paper takes into account only five of them – those that are widespread in the suburbs, namely: (1) a paved square, (2) a green square, (3) a commercial street/ road, (4) a commercial and service building, (5) a polycentre, which includes a few scattered equally important centre-forming objects (synergy effect turns the entire area into a local centre), and adds two more forms, which are predestined to originate an activity node: (6) a train station, and (7) a main crossroad. The type of a LC's core reflects the history of the suburb, but also affects the attractiveness of the central space, safety for its users, and conditions for the location of specific functions. Some cores (e.g. historical market square) may be symbolic for the whole suburb.

3.3 Location

The location of a suburban local centre remains in a cause-and-effect relationship with the advantages of accessibility and frequency of use of the various functions. The location is usually considered in relation to (1) the boundaries of the neighbourhood (central, peripheral, and outside the neighbourhood), and (2) the main roads and communication nodes, walking routes, bike paths, and public transport stops, analysed together with the frequency of public transport services[1].



Fig. 4: Example of scattered layout of LC in Ivanka, Slovakia (main objects: 1 – recreational area, 2 – school) Source: Google Earth Pro, 22 June 2022



Fig. 5: Community centre at the edge of Żółwin, Poland Source: Google Earth Pro, 22 June 2022

In the Perry's neighbourhood unit model, a centrally located community centre (social, cultural, and recreational amenities) is segregated from commercial uses at the edges, since retail and services tightly connected with fast vehicle arterials are expected to protect the interior of the neighbourhood from traffic and noise. Following the criticism of this concept, it is better when mixed-use central space as a driving force for the social and economic vitality of the whole neighbourhood, is centred and well connected by a street network. The main activity node of the organically growing suburbs is more often located centrally, especially in the case of fully-planned or core-village suburbs, while in new suburban settlement units arising spontaneously, without a predetermined road system, LC develops much later than residential functions, hence it is located peripherally, sometimes even at some distance from residential buildings, which intensifies spatial and functional chaos (Fig. 5).

When it comes to the proximity to the public transport infrastructure, the typology focuses solely on the major transportation nodes and public transport stops (the frequency of public transport services has been omitted). In many cases, suburban LCs are located at some distance from train stations or main bus stops (many bus stops are located alongside supralocal arterials that are peripheral to or outside the neighbourhood). This is in line with Perry's concept, although it has been shown that the integration of public transportation and land use through transit-oriented development (TOD) programs yields important sustainable benefits (National Academies…, 2004; Curtis et al., 2009). For the densification of the suburbs, public transport connecting spaces of everyday life is more important than public transport on mega-infrastructures that are not integrated into the neighbourhood (Young and Keil, 2010). The preferred location of a local centre is in walking distance to most houses, at the convergence of pedestrian, cycle, and bus/train routes, at the point of maximum connectedness (Vall-Casas et al., 2011). This implies centring neighbourhoods on arterials or main roads in order to make transit service more cost-effective and more viable (Poticha, 2008, after: Mehaffy et al., 2015). Moreover, a modified model of the neighbourhood unit should contribute to reducing carbon emissions and its ecological footprint by better access to public transport.

3.4 Functions

Assuming that a centre is constituted not only by the space, but also by the functions, it is worth emphasising that a LC should be a single destination for civic, institutional, and commercial functions (Medwed, 2017). Functional integration allows institutionally different types of activities and different categories of people to coexist side by side. LCs as the basic public spaces should enable residents to undertake necessary activities (those that we are obliged to do, such as going to work, school, shopping, etc.), optional activities (those that we want or feel like doing), and social activities (assuming voluntary human interaction) (Gehl, 1987). In addition to the types of activity, the very position of each service in the hierarchy is also important for the social and economic vitality of space. Services can be assigned to three levels of service nodes (Damurski et al., 2015):

[1] It is suggested to aim for at least six buses/ trains per hour (Rice, 2010)

1. The level of basic services (BS): the presence of small convenience stores, car-service points, small playing fields, public transport stops;
2. The level of basic centre-forming services (BC-FS): the presence of public services of an everyday nature (education, health, administration, sport and recreation, culture), medium-sized commercial facilities, eateries, and crafts;
3. The level of centre-forming services (C-FS): the presence of large-area and specialised trade, as well as public and commercial services of a higher ranking (upper secondary schools, hospitals, stadiums, museums, tourism, entertainment, etc.).

Since the subject of the analysis are local centres of the neighbourhood catchment area, the typology takes into account mainly the first two levels.

In addition to focusing on meeting basic needs, an important feature of LC is enabling residents to lead their own lifestyle. Suburbanites often demand attractive and well-equipped recreational areas. In post-socialist Europe, many such spaces have been created in recent years and financed from European Union funds. If such an area is located in the immediate vicinity of the LC, then the central space is enriched with an additional element strengthening its social function and attractiveness. The combination of retail, service, and recreational functions makes suburban public space more vital (Mantey, 2019), therefore outdoor recreational space should play an important role in the process of retrofitting suburbs.

As a final effect, the new typology of suburban LC of a neighbourhood catchment area is built on six criteria and a set of the most frequent situations within each of them (Tab. 1).

After developing the typology, six institutional Warsaw suburbs[2] have been selected for further research, namely: Nowa Iwiczna (municipality of Lesznowola), Mysiadło (municipality of Lesznowola), Chotomów (municipality of Jabłonna), Komorów (municipality of Michałowice), Stare Babice (municipality of, Stare Babice), and Raszyn (municipality of. Raszyn). Although the Warsaw Metropolitan Area differs from other city regions in Poland (it is the largest and the fastest-growing urban region in Poland, with the highest share of the affluent metropolitan class), it has the most diversified suburbs in terms of their origin, spatial layout, and location in relation to transportation routes and public transport. Finally, local centres of the six selected suburban settlements have been characterised according to the criteria of the typology. They represent various but common forms of concentration of non-residential functions in suburban neighbourhoods on the outskirts of Warsaw. Additionally, residents of the suburbs under study were asked to indicate which space they perceived as local centre. This information was obtained in the survey conducted in June 2021 via Facebook. Basic information about the respondents is presented in Table 2. The sample is not representative for the study area, since the survey was rather aimed at initial insight into residents' perception than inference about the population from a sample. The respondents were also asked to list preferred objects and functions for the LC in their neighbourhood.

In the last stage of the research, central spaces designated according to adopted criteria and spaces indicated by residents as local centres have been confronted with spatial policies[3] of suburban municipalities. For this purpose, directions of spatial development have been analysed.

4. Results

In search of the most effective solutions for the retrofitting Polish suburbs, the criteria of the new typology have been divided into two groups describing (1) spatial and (2) social potential of the central space (Tab. 3). The basis for distinguishing individual types of LC is their spatial potential resulting from the urban layout and form, while the social potential expressed in the hierarchy of service nodes and the presence of recreational areas additionally differentiate each type. Table 4 presents examples of the types of local centres that are characteristic of Warsaw suburbs. They have been designated and then described according to the adopted framework presented in Table 3. It has been

Category of criterion	Criterion	Possible situations
Spatial form	(1) Spatial layout in which the LC is embedded	1. concentric; 2. linear; 3. scattered (not embedded in a legible spatial arrangement)
	(2) Spatial form of the LC's core	1. market square; 2. green square; 3. main crossroads; 4. sector of a local or supralocal commercial street/ road; 5. commercial, service, or public utility building; 6. outdoor green/ recreational area; 7. a few scattered equally important centre-forming objects
Location	(3) Location of the LC within the neighbourhood	1. central; 2. peripheral
	(4) Location of the main public transport stop/station	1. within LC; 2. outside LC
Functions	(5) Hierarchy of services	1. basic services; 2. basic centre-forming services; 3. centre-forming services
	(6) The presence of an outdoor recreational area of at least 1,000 m^2	1. LC with an outdoor recreational area; 2. LC deprived of an outdoor recreational area

Tab. 1: Criteria of the typology of suburban LCs of a neighbourhood catchment area
Source: author's elaboration

[2] Institutional suburb is an administrative unit (usually a village). This scale of suburbs enables the municipality to shape the street layout and to equip the suburb with infrastructure, public facilities, and public objects.

[3] In Poland, each municipality is obliged to prepare its spatial policy, which is a document called the Study of the Conditions and Directions of the Spatial Development of a Municipality.

	Chotomów	Komorów	Stare Babice	Nowa Iwiczna	Raszyn	Mysiadło	Total
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
				sample			
Gender							
female	35 (39.8)	56 (69.1)	58 (63.7)	50 (78.1)	66 (75.9)	47 (73.4)	368 (67.5)
male	53 (60.2)	25 (30.9)	33 (36.3)	14 (21.9)	21 (24.1)	17 (26.6)	177 (32.5)
Age							
18–25	13 (14.8)	19 (23.5)	14 (15.1)	16 (25.0)	13 (15.1)	11 (17.2)	95 (17.4)
25–34	32 (36.4)	15 (18.5)	19 (20.4)	6 (9.4)	24 (27.9)	18 (28.1)	126 (23.0)
35–44	24 (27.3)	20 (24.7)	31 (33.3)	25 (39.1)	30 (34.9)	17 (26.6)	162 (29.6)
45–59	11 (12.5)	20 (24.7)	22 (23.7)	15 (23.4)	15 (17.4)	15 (23.4)	120 (21.9)
above 59	8 (9.1)	7 (8.6)	7 (7.5)	2 (3.1)	4 (4.7)	3 (4.7)	44 (8.0)
population (year)*	5,810 (2019)	4,584 (2018)	2,202 (2015)	4,073 (2019)	7,244 (2014)	3,684 (2019)	

Tab. 2: Characteristics of the respondents. Source: author's elaboration
*Note: * The Central Statistical Office in Poland does not publish demographic data at the village level, hence population data comes from different websites, including official websites of the municipalities, but this is not always the most recent data.*

assumed that a suburban LC of a neighbourhood catchment area should include at least three neighbourhood-scale units of non-residential functions, at a distance of not more than 100–130 m from each other (Mantey and Pokojski, 2020). Each LC categorised according to the new typology has been juxtaposed with a map derived from the spatial policy of the municipality under study and spaces that are perceived as local centres by the residents.

4.1 LCs designated according to adopted criteria

The research on institutional suburbs has showed that spatial criteria differentiate local centres more than social criteria. Considering spatial potential, several characteristic structures in which local centres are embedded can be identified, while in the case of social criteria, the vast majority of the LCs are similar and offer not only basic, but also public services, and many of them are equipped with recreational space as well (Tab. 5). Most suburban LCs do not constitute a compact, well-planned entity. Moreover, the study of local centres of a neighbourhood catchment area has revealed that suburban structure features a very local form of activity, limited to small-scale service units mixed with private houses.

The type of suburban LC is strongly related to the origin of a given suburb. The best-formed LCs are common among the pre-World War II suburbs (the so-called old suburbs). Some of them follow the garden city concept with a centrally located railway station (Komorów), others are former rural villages developed around the market square with a church as the landmark (Stare Babice, Fig. 6). Pre-war suburbs have a legible concentric layout. Small shops and service points are concentrated around the core, while schools, larger stores, and other public services are in the 'second line' or slightly further. Old suburbs are also represented by urban villages well connected with the nearby city (Zimnicka and Czernik, 2007). Most of the urban villages are not comprehensively planned. They have rather enlarged systematically in a chaotic manner as a result of infills and small spatial extensions of existing settlements. The core of such suburbs is usually a school or other important public building. After the mass suburbanisation period, some suburbs of this type have initiated the retrofitting process based on a newly built market square (Raszyn, Fig. 7). It happens, however, that instead of being conducive to social integration, the new core space serves a merely decorative function or expresses the desire to create a new identity of the suburb.

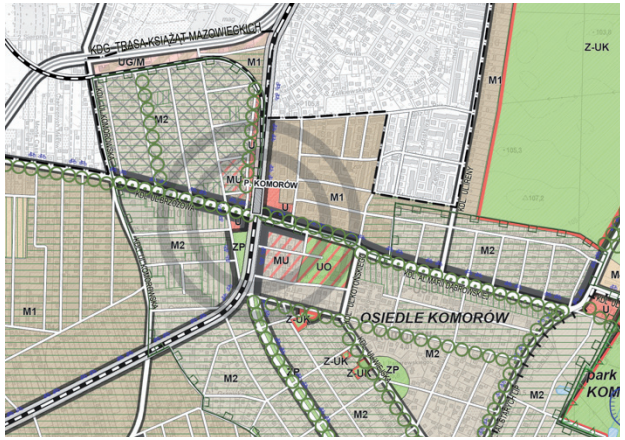
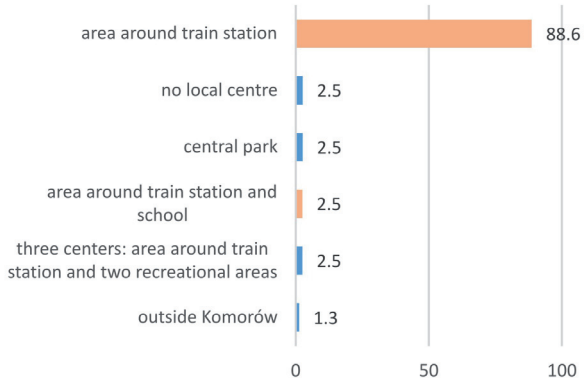
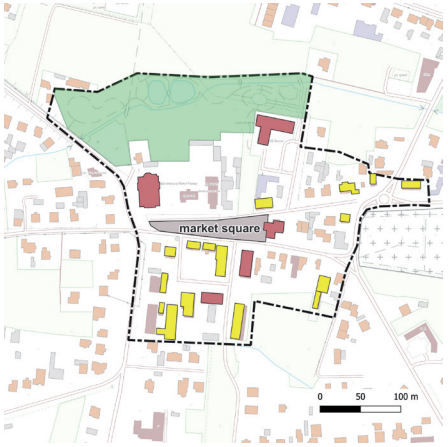
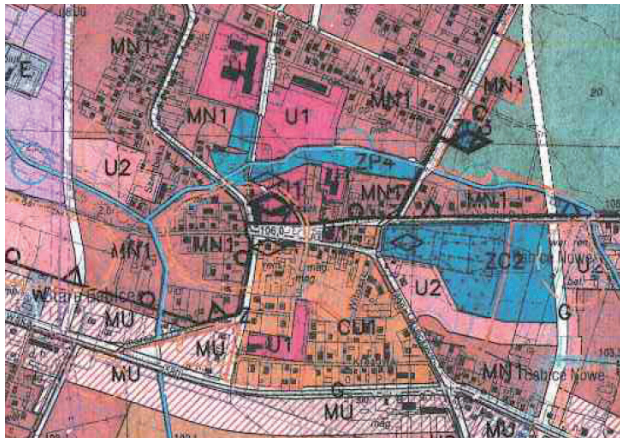
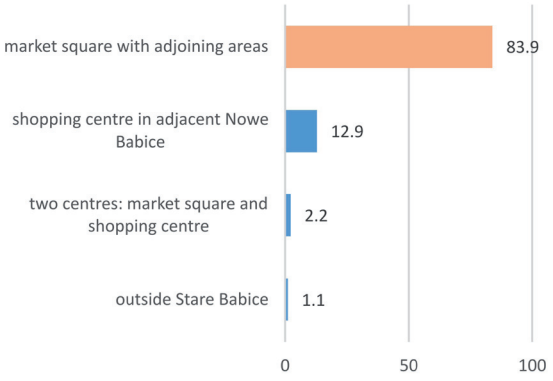
In Poland, new suburbs often have no central point that organises the spatial structure of the entire suburb. In the case of suburban settlements that spontaneously developed from linear rural villages, the role of LC is often played by a section of the main road. The rural origin of such suburbs is clearly outlined in pre-existing development alongside the road, where small shops and services are mixed with houses of old residents (Chotomów). It may happen that the central space of this type is located peripherally, thus exacerbating the effect of spatial disintegration of a given suburb (Mysiadło). When spontaneously developed, linear LCs are generally unattractive. They do not encourage people to stay there longer than necessary, although they have the potential to become a significant space. This can be done by transforming them into a promenade, providing meaningful images, giving the suburbs their own identity (old buildings and historical objects alongside the main road).

In new suburbs, LCs can also take the form of a block of streets around a school or other public building, thus providing greater spatial compactness of central space and sometimes higher social value compared to linear centres. This category of central space is represented by the polycentric type of LC (Nowa Iwiczna). The impetus for the development of this type of centre is the location of a public building within the existing urban fabric. This building attracts other equally important facilities that are clustered in a random block of streets, previously not planned for such functions. A polycentric LC with underdeveloped commercial functions is typical of chaotically developed new suburbs with an illegible spatial arrangement.

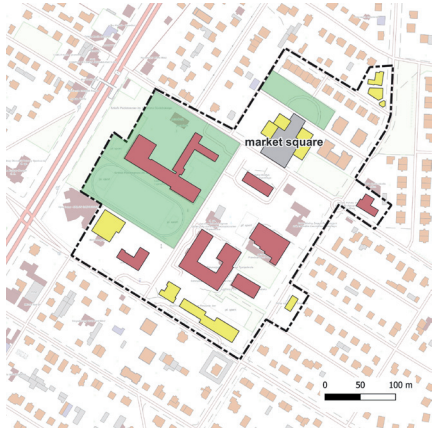
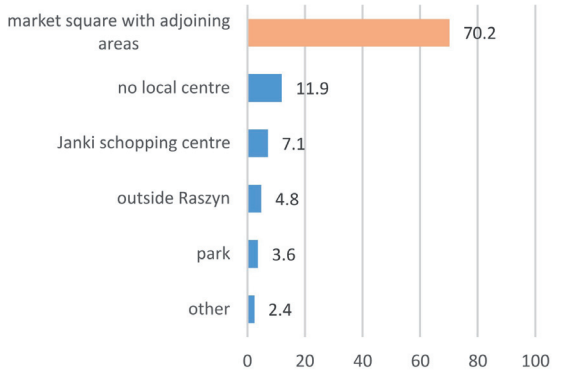
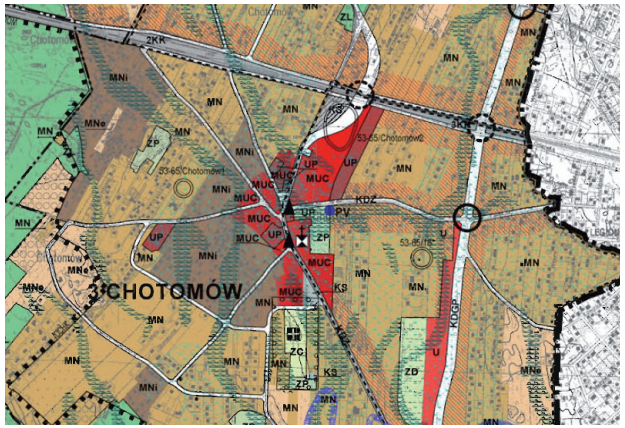
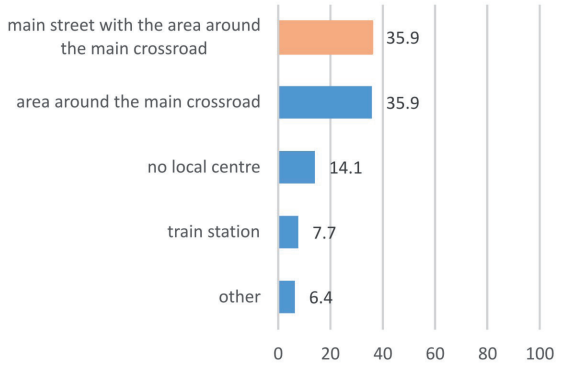
In the case of new suburbs, important transport nodes are often located peripheral to LCs. No vacant land and the predominance of private ownership make it difficult for the local authorities to implement public functions around such

SPATIAL POTENTIAL				SOCIAL POTENTIAL	
(1) Spatial layout of LC	(2) Spatial form of the LC's core	(3) Location of LC within the neighbourhood	(4) Location of the main public transport stop/station	(5) Hierarchy of services	(6) The presence of an outdoor recreational area of at least 1,000 m^2
1. concentric	1. market square 2. green square 3. main crossroads	1. central	1. within LC	1. basic services 2. both basic and basic centre-forming services 3. both centre-forming services and other services	1. LC with an outdoor recreational area 2. LC deprived of an outdoor recreational area
2. linear	4. sector of a local commercial street	1. central 2. peripheral	1. within LC 2. outside LC		
	5. sector of a supralocal commercial road	2. peripheral	1. within LC	4. centre-forming services 3. both centre-forming services and other services	
3. scattered (not embedded in a legible spatial arrangement)	6. commercial, service, or public utility building	1. central 2. peripheral	1. within LC 2. outside LC	1. basic services 2. both basic and basic centre-forming services 4. basic centre-forming services 5. centre-forming services	not applicable
	7. outdoor green/recreational area			1. basic services 4. basic centre-forming services	1. LC with an outdoor recreational area
	8. a few scattered equally important centre-forming objects		1. within LC 2. outside LC	6. two or more equally important basic centre-forming services, few or no basic services 7. two or more equally important centre-forming services, few or no basic services	1. LC with an outdoor recreational area 2. LC deprived of an outdoor recreational area

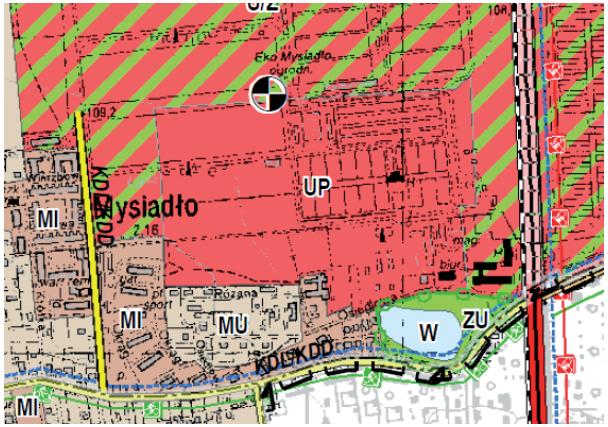
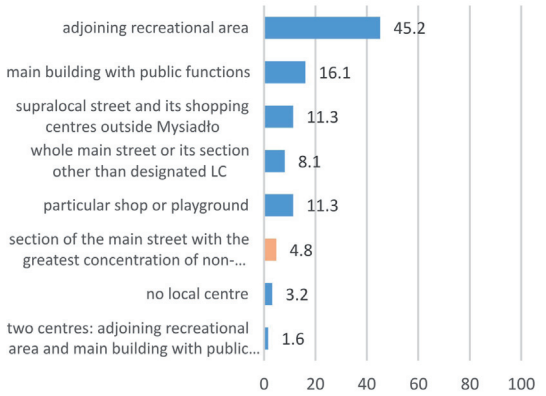
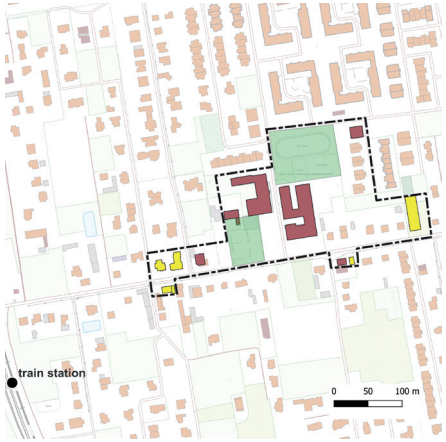
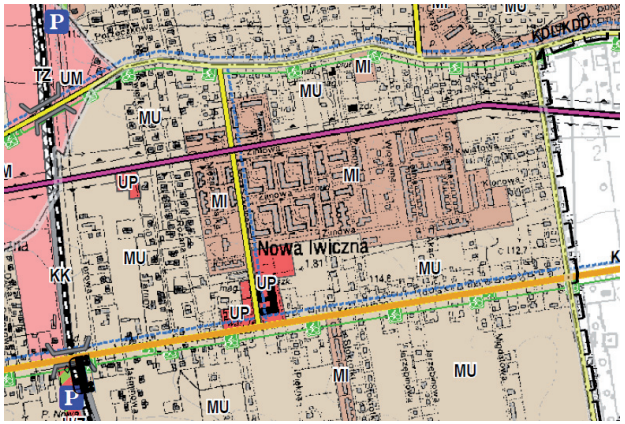
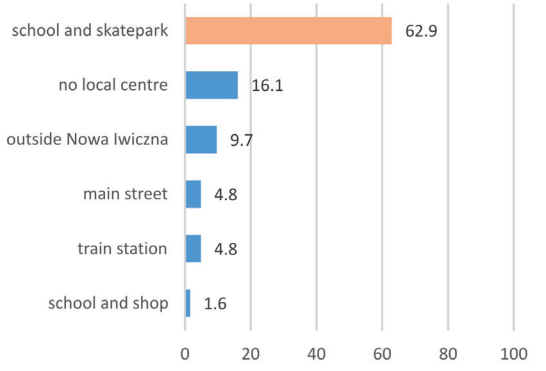
Tab. 3. Typology of suburban local centres of a neighbourhood catchment area
Source: author's elaboration

LC designated according to adopted criteria	LC designated in the spatial policy[a] of the municipality	LC indicated by the residents (%)
KOMORÓW		
		
LC with a centre-forming layout and functions, and a high social potential	Centre of the priority area with retail and service units, education services, and greenery	LC indicated by the residents consistent with the LC determined according to the adopted criteria
STARE BABICE		
		
LC based on a historical market square	No central space; service areas and residential and service areas designated	LC indicated by the residents consistent with the LC determined according to the adopted criteria

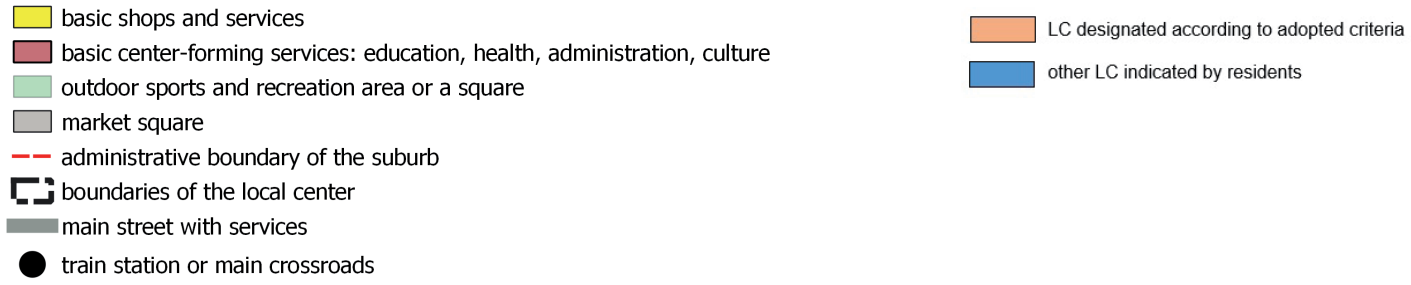
Tab. 4: Types of local centres characteristic of Warsaw suburbs – for explanations see legend on p. 203

LC designated according to adopted criteria	LC designated in the spatial policy[a] of the municipality	LC indicated by the residents (%)
	RASZYN	
		
LC based on public buildings and a newly developed market square	Centre of the municipality with areas of multifunctional development and areas of commercial services	LC indicated by the residents consistent with the LC determined according to the adopted criteria
	CHOTOMÓW	
		
Linear LC with the main section, but low social potential	Areas of the very centre of the village, areas of local public services and greenery	LC indicated by the residents partially consistent with the LC determined according to the adopted criteria

Tab. 4: Types of local centres characteristic of Warsaw suburbs – for explanations see legend on p. 203

LC designated according to adopted criteria	LC designated in the spatial policy[a] of the municipality	LC indicated by the residents (%)
	MYSIADŁO	
		
Linear LC with poor location, poor service offer and low social potential	No central space; residential areas and residential and service areas	LC indicated by the residents inconsistent with the LC determined according to the adopted criteria
	NOWA IWICZNA	
		
LC with an illegible layout and low commercial potential	No central space; public service areas	LC indicated by the residents rather consistent with the LC determined according to the adopted criteria

Tab. 4: Types of local centres characteristic of Warsaw suburbs – for explanations see legend on p. 203



Tab. 4: Types of local centres characteristic of Warsaw suburbs
Source: author's compilation

Notes: [a] Table presents maps from spatial policies of five suburban municipalities, namely: Michałowice, Stare Babice, Raszyn, Jabłonna, Lesznowola
Spatial policies retrieved from the following websites:

1. *https://bip.michalowice.pl/files/1095951643/zalacznik-nr-2-c-kierunki-rysunek-podstawowy.jpg*
2. *http://archiwum.starebabice.bip.net.pl/pliki/125506_Uchwala_Nr_326_-_zalacznik_nr_3.jpg*
3. *http://bip.raszyn.pl/?a=9288*
4. *http://www.bip.jablonna.pl/container/dokumnety/zagospodarowanie%20przestrzenne/studium%20uwarunkowan/z3a.pdf*
5. *https://lesznowola.eobip.pl/_gAllery/24/91/24911/Rysunek_nr_1.pdf*

LC	Spatial potential	BS	BC-FS	C-FS
Komorów	concentric layout with a centrally located railway station and a concentration of commercial functions as a core	13 small stores* and services, 2 pharmacies, bus stop	5 eateries, 2 recreational areas, health centre, train station, bank, post office, primary school with a sports field, senior club	secondary school with a sports field
Stare Babice	concentric layout with a historical market square and a church as a landmark, concentration of commercial functions nearby	13 small stores* and services, bus stop	4 eateries, 2 health centres, 2 municipal offices, church, park, post-office	
Raszyn	concentric layout with a market square as a newly developed core and equally important public buildings throughout the whole LC	13 small stores* and services, 2 pharmacies	4 eateries, 2 buildings of a primary school with a sports field, 2 banks, kindergarten, library, post office, municipal office, health centre, fire station, medium-sized shop	
Chotomów	linear layout with the largest crossroads as a central point, different functions scattered along the sector of the main street	4 small stores* and services, small square, bus stop	2 medium-sized shops, church, primary school with a sports field, post office, cultural centre, restaurant	
Mysiadło	linear layout with the multifunctional building as a central point, located peripherally along a sector of the main street bordering the adjacent suburb	11 small stores* and services, pharmacy, playground, bus stop	2 eateries, library, post office	
Nowa Iwiczna	scattered layout with a polycentric form of the LC's core embracing equally important educational and recreational objects, located within a quarter of streets	4 small stores* and services	3 buildings of a primary school, cultural centre, skate park, bank, medium-sized shop	

Tab. 5: Service offered by suburban local centres. Source: author's elaboration
*Notes: * Stores embrace food and industrial goods supply. BS – basic services; BC-FS – basic centre-forming services; C-FS – centre-forming services*

facilities (Nowa Iwiczna). If a transport node is too distant from the LC, it negatively affects the number of potential users and the economic vitality of the central space.

In recent years, suburban recreational areas have gained importance as a new element of the development of suburban space, especially after Poland's accession to the EU, which opened up new opportunities for financing this type of facility. Recreational areas in dispersed suburbs, especially playgrounds and local sports fields, give opportunities to gather and integrate, although they rarely attract commercial and service functions (e.g. Stare Babice, Mysiadło, Nowa Iwiczna). In the case of suburban LCs, small recreational areas have low centre-forming potential, although they significantly increase attractiveness and multi-functionality of the whole central space.

4.2 LCs indicated by the residents

In the case of a centre-forming concentric layout based on the main crossroads, a road crossing with a railway line, or a market square, accompanied by commercial and public premises, it is easiest for the residents to indicate the central space unambiguously (Komorów, Stare Babice). Compared to concentric layouts, newly built public utility buildings lacking basic services nearby, located within a random block of streets, are less frequently recognised as a local centre. Linear structures turned out to be the most problematic in this regard. The research revealed, however, that the location of a shopping centre or a larger supermarket on the periphery, on the border, or outside the suburb (Stare Babice) is one of the factors disrupting any regularities in perceiving particular structures as local centres. On the other hand, retrofitting the space by introducing a square market with centre-forming functions may reverse the tendency of perceiving large-scale commercial buildings as a LC (Raszyn).

The main centre-forming objects or facilities such as railway stations are naturally perceived as local centres. They are deemed as such even if they are located at some distance from the main concentration of commercial functions and there are no retail and service units around them (railway stations in Chotomów and Nowa Iwiczna). In the case of the underdevelopment of commercial functions, respondents more often say that there is no local centre. If the greatest concentration of trade and service is located peripherally, more residents are willing to look for a LC outside the suburb (Mysiadło).

4.3 Approach towards planning local centres

The intention to retrofit suburbs by reinforcing local centres should be outlined in the spatial policy of the municipality. In the suburban municipalities under study, however, there is quite a wide variety of approaches to planning local centres, setting their boundaries, and naming, which may be a significant obstacle in making suburbs more sustainable. Local centres are most often designated for villages of key importance for the municipality (Komorów, Chotomów) or villages that are the seat of the municipality (Raszyn), although it also happens that for the latter, spatial policy does not indicate central space (Stare Babice). For the village centres, spatial policies use different nomenclature, e.g. centre of the priority area, centre of the municipality, areas of the very centre of the village. Their boundaries are



Fig. 6: Market square with a church in Stare Babice (Photo: M. Osiak)



Fig. 7: Newly-built market square with a fountain in Raszyn (Photo: A. Kryczek)

also delineated differently. Some local centres are marked with a signature only (Komorów, Raszyn), while others are precisely delimited on a map (Chotomów). When it comes to the functions of the areas planned to be local centres, commercial services dominate along with public services.

Few municipalities emphasise the multifunctionality of such spaces (Raszyn). Some municipalities have not designated local centres in their spatial policies, also for those villages that are subject to intensive suburbanisation (urban villages such as Mysiadło, Nowa Iwiczna). Some of them have delimited only areas for public services, most often educational (Nowa Iwiczna). Such areas are perceived by the residents as local centres although commercial functions around them are underdeveloped.

In the case of suburbs originated from previous rural villages, the central space is closely related to service facilities and landmarks. For this type of suburbs, a church (or a chapel) is one of the most important objects. Apart from its sacred function, it often plays a cultural and social role. When it comes to the facilities generating social activity, they embrace also schools, public administration buildings, health centres, commercial and service premises, rural community

clubs, and fire stations. Compared to the old suburbs, new suburban settlements are deprived of such a variety of utilities and landmarks. Their local centres usually rely on a newly built school as the nucleus.

In recent years, numerous sports facilities and playgrounds have been built in both old and new suburbs (Fig. 8). Some of them are centrally located, but compared to other objects, their potential to reinforce the central space is weaker due to low social vitality (Mantey, 2019). Suburbanites, when asked about the objects that could encourage them to use local centres more often, listed outdoor mini-markets and various eateries such as bars, pizzerias, restaurants or café (Fig. 9). Retail space with fresh agricultural products and third places where local social ties are maintained (Oldenburg, 1999, 2000) seem to be the most missing and at the same time the most desirable suburban facilities. They have a high social potential to increase the vitality of suburban central spaces.

5. Discussion and conclusions

The typology of local centres presented in this report organises the previous attempts to categorise this kind of space and makes a shift towards suburbia. It helps to identify meaningful spaces that may act as local centres of a neighbourhood catchment area in different spatial arrangements of post-socialist suburbs. Although the typology has been tested in the Warsaw urban region, the premise for its wider application is the similarity of suburbanisation processes in all Central and Eastern European (CEE) countries. On the outskirts of large post-socialist cities, suburbs are growing mainly from villages, but also from small towns, pre-war garden cities, socialist suburban enclaves, and socialist recreational cabin settlements. The LC of Jesenice (Prague urban region), described by Zévl and Ouředníček (2021), seems to be representative of these types of old suburbs. The original core of the village is situated on the main road to Prague's south-eastern hinterland. In the core, there is a mixture of building designs and uses, and the ground level of buildings is frequently used for commercial purposes (restaurant, post-office, pharmacy, etc.). The polyfunctionality of this sector of the road makes it the centre of Jesenice, although it is not perceived by residents as such. According to the Strategic Plan of the town, residents miss a clear central public space (Město Jesenice, 2011, after: Zévl and Ouředníček, 2021).

Apart from the old suburbs, there are also new ones that arise as new settlements on "greenfields" (Zębik, 2011; Kubeš and Nováček, 2019; Mantey and Sudra, 2019), often in the form of leap-frogging urban sprawl. Sprawling suburbs still lack basic public facilities, local centres and infrastructure. Only in some cases, the development of commercial



Fig. 8: New park in Stare Babice (Photo: D. Mantey)

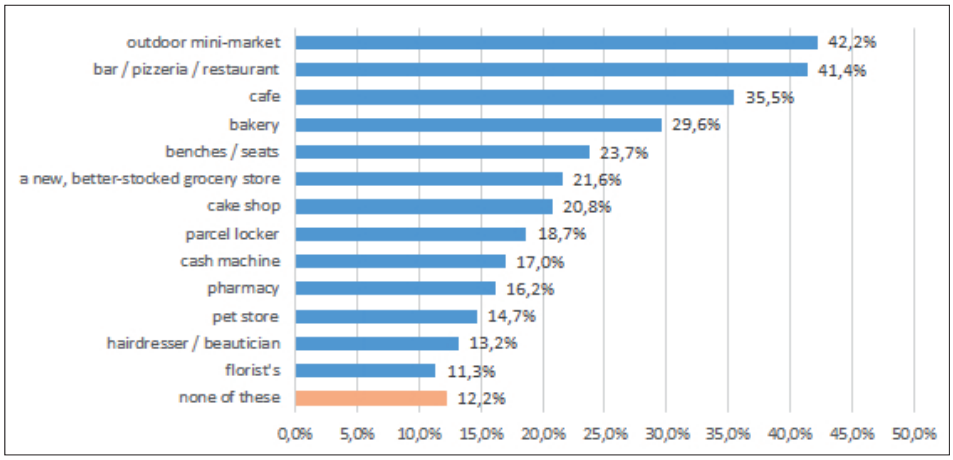


Fig. 9: New facilities and functions that would encourage suburbanites to use a local centre more often (N = 476) Source: author's elaboration

facilities has just begun along the major roads (Dinić and Mitković, 2016). The type of suburban development that has not yet taken root in this part of Europe is transit-oriented development (Zębik, 2011).

Since in all post-socialist countries similar processes are the driving forces behind suburbanisation, the spatial arrangements of individual settlement units are also somewhat comparable. Local centres are most often in the core of old suburbs. Many new neighbourhoods are deprived of nodes of social and economic activity since they are located on the edges of existing settlements, often in isolation from the original village, or as a separate small settlement unit. It is much more difficult to establish a local centre in a new suburb, not only because of the spatial disorder but also because of the lifestyle of the residents who satisfy various needs outside their place of residence. Thus, one of the biggest problems post-socialist suburbia faces nowadays is mono-functionality, most often the non-existence of any other urban use except the residential one, and poorly designed public spaces (Dinić and Mitković, 2016).

This article suggests retrofitting suburbs by strengthening local centres, which may be one of the models of suburban transformation, together with the three already existing ones:

1. Recovering the pre-existing networks (rural roads, old paths, and watercourses) recognised as strategic components for reconnecting and providing civic cohesion (Holcomb, 2008; Vall-Casas et al., 2011);
2. Recycling of dead shopping malls or commercial strips (Dunham-Jones and Williamson, 2009);
3. Recovery of metropolitan open spaces (Girling and Helphand, 1997; Platt, 2006).

Here it is suggested that a multifunctional local centre served by public transport should become the essence of a modified neighbourhood unit concept. Strengthening neighbourhood units in post-socialist Europe, however, may be problematic. This is due to common symptoms of disordered (sub)urban sprawl and poorly organised built-up areas, which is manifested in small-sized new suburban communities (the community is not large enough to have its own school), chaotic urban structure with no centre, poorly arranged streets, commerce, and industry enclaves, and intensive road traffic (Kubeš and Nováček, 2019; Zębik, 2011).

When adopting the retrofitting model based on a neighbourhood central space, breaking down mono-functionality should be a prerequisite for integrating people and their activities (Gehl, 1987). Fortunately, most of the already existing suburban LCs offer not only basic services, but also basic centre-forming services, mainly education, administration, health, sport, and recreation, less often culture. Public facilities, however, are not able to increase the economic vitality of overly dispersed suburbs with poor walking conditions.

The social potential of central space is determined not only by its functions but also by the spatial arrangement in which it is embedded. Concentric layouts attract people and different non-residential functions more effectively than linear ones, since they direct a large proportion of pedestrian traffic to one place. There is a positive correlation between higher street integration measured by closeness (how close each segment is to all other segments in the network) and a greater pedestrian volume (studies that demonstrate this correlation are mentioned by Jabbari et al., 2021). Places linked directly to other environments are more accessible and tend to attract more people, making areas busier. The very form of the concentration of services is also important. For social and community-building reasons, the market square seems to be better than the main crossroads, just as the local street is better than the supralocal road. Supralocal roads have less social potential since they are more friendly for cars than for pedestrians and serve not only local users. Unfortunately, this is where the main public transport stops are usually located, thus depriving LCs of an important function that could increase their utility. The least favourable situation for strengthening neighbourhood ties is the peripheral location of the LC within the neighbourhood, more common in the case of linear centres.

A local centre as a meaningful space is perceived by the residents through the prism of the legibility of the broader spatial arrangement. There are several spatial components that are most often noticed and remembered by the residents, including city crystallisation elements, streets, areas, border lines and strips, spatial dominants, outstanding landscape elements, nodal points, special signs (Wejchert, 1984). The lack of individual features makes the space difficult to identify, while elements crystallising the village plan affect the ease of recognising in space, moving around, and noticing places. When recognising some spaces as central, the presence of key objects with centre-forming functions is equally important. Primary schools and the accompanying sports areas are of special importance, especially in new suburbs. Apart from the objects that facilitate perceiving some spaces as central, there are also factors that distort such recognition, namely the excessive dispersion of buildings, and hence trade and service points; peripheral or random location of the main activity node or centre-forming object; poorly equipped central space; the proximity to the big-box shopping centre or large recreational area. This may explain why the market square is not always perceived as a local centre.

In search of the model of retrofitting Polish (but also other post-socialist) suburbs, it is worth focusing on shifting suburbs from settlement units dominated by anonymity into genuine neighbourhoods. Referring to the neighbourhood unit theory (Perry, 1929), it should be emphasised that neighbourhoods require more than mere geographical boundaries, they involve the fundamentally functional needs of the people therein (Park and Rogers, 2015). Suburban local centres as meaningful spaces have a chance to respond to these needs provided that they are multifunctional, safe, structured, and in walking distance from most of the houses. Such spaces have a chance to maximise the liveliness of suburban neighbourhoods. Their potential, however, can be activated when optimal spatial conditions persist. To achieve this, the process of densification of suburban settlements through infill and redevelopment strategies should be implemented into spatial policies of suburban municipalities. Although new suburbs abound with spaces enclosed between buildings that lack quality and seek new functions and identities, they cannot be reused or used for the public easily since most of the suburban space has the status of private property. Besides, suburban centres are more clusters of services within individual land parcels than fully formed public spaces, which would have the potential to integrate the scattered housing development and create new contemporary centres at a local scale (Bajwoluk, 2015).

Redevelopment strategies, therefore, should involve improving the walkability of the entire suburb and accessibility to public objects and facilities, by building

interconnected street networks that distribute traffic and reduce overall vehicle kilometres travelled. The infill approach, in turn, lies in densifying the core of the suburb by introducing public transport and localising public objects as well as recreational areas in central space. Creating or strengthening local centres can be accomplished through:

1. density, increasing in central space and reducing with distance;
2. accessibility to different key destinations (schools, bus stops, train stations, etc.) within walking distance;
3. mixed-use;
4. a transport system that prioritises not only the needs of pedestrians and cyclists but also public transport passengers (UTF, 1999; Williams, 1999).

The viability of local shops and services, and the use of public transport are negatively affected by the low density of the suburb, the insufficient population in the catchment area of the LC, and the adjacent big-box retail and service facilities. As a consequence, the potential of local centres can be significantly diminished.

In conclusion, post-socialist suburban local centres do not constitute fully formed compositional and functional structures. They include spaces with a mature urban form but poor functional offer, spaces along transportation routes but with unattractive public space, or spaces offering commercial facilities but not much else. This is partly due to diversified approaches towards planning LCs, manifested in the spatial policies of suburban municipalities. Such diversified approaches towards layouts, forms, location, and functions are recommended to be standardised, which requires top-down implementation of urban standards. In the ongoing transformation of metropolitan areas in the post-socialist CEE countries, the formation of hierarchical network of subcentres outside of the metropolitan core is also not fully articulated (Stanilov and Sýkora, 2014), although advisable.

When developing standards for suburban central spaces, however, we should take into account not only street layout and the distribution of commercial facilities, but also – and perhaps most importantly – the socio-cultural needs of the inhabitants, their lifestyle, and their ways of spending free time. When looking for a model of "centrality" for single-family housing estates, it is worth recalling the concept of the so-called "third places" by R. Oldenburg (1999, 2000). Suburbanites often prefer spaces of relaxation in public, encountering familiar faces, and making new acquaintances rather than spaces to exchange goods, services, and information (Mantey, 2015). Such needs are part of the ideal of suburban life, associated not only with a quiet and peaceful place to live but also with attractive places to spend free time. Shopping centres attracting suburban residents not only with their retail offer but also with eateries, cinemas, playrooms for children, etc., are the worst scenario for the social life of post-socialist suburbs and together with the lack of planning of local centres, one of the most serious inhibitors of the retrofitting process.

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