Items and proposals related to the suburban area-planning within the big city sphere of influence

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Abstract. The paper is dedicated to the major aspects of formation and functioning of the suburban areas within the big city sphere of influence. A set of questions was determined to be studied, in particular, definition of essence of the concept of “suburban area”, definitions of suburban area. The new trend of territorial development is the processes of population decentering from the central districts per city, which is related to the factors of development of the objects of social and economic support of the population, as well as a number of environmental problems. The paper proposes a model of suburban area territory planning within the big city sphere of influence, which allows managing and using territories of suburban area a more efficient way.

1. Introduction
Nowadays in the modern theory and practice of urban development and territorial planning issues related to the process of formation and functioning of suburban areas are of key importance. Development of suburban areas are directly connected with the formation of agglomerations. As a result of agglomeration suburban territories around cities started to be dynamically developed. In more recent times, terminal, transport, trading and other functions focused on the central city have been actively developing. Moreover, there is marked increase of land market on the part of investors, associated with several factors: demand for large areas (for example, construction of super-markets and car parking space planning, construction of warehouses etc.), low price for lands, avoidance of transportation problems of city etc. Such construction projects of residential, public and other purposes lead to the problems related to the management and use of territories of suburban area.

2. Formatting the title, authors and affiliations
Suburban areas began to be developed at the end of the nineteenth century. This process occurs due the urban development. A problem of interaction between cities and adjoining territories holds a high position in the native and foreign literature. The discussion when defining the concept of “suburban area” and its criteria was participated by such scientists as M.M. Gabrel [1], O. O. Denysenko [2], G. M. Lappo [3], M. O. Khave [4], B. S. Cherkes [5], T. I. Manshyllina [6], V.O. Yatsenko [7], and others. Problems of formation and development of cities and suburban areas are studied in the scientific works of Bilokon’ Yu.M. [8], M.M. Habrel [9], M.M. Dyomin, O.S. Petrakivska [10], where predominately city-planning, ecological and land aspects of interaction between these subsystems in the urban development sphere are highlighted. Theoretical and practical issues of formation and
functioning of suburban area of native and foreign cities are highlighted in the works of V.L. Holubiev, S.N. Kovalyov, A.S. Kuskov, A.H. Makhrova, G.M. Lappo, E.N. Pertseik, M.O. Khauke, V.V. Khokhlova and others.

3. Research Objective
Despite of large number of works devoted to the issues of formation and functioning of suburban areas, many items remain understudied and invite further investigations. Experts of different scientific directions keep in sight the issues related to the definition of the concept of “suburban area”, limitation of urban extension, definitions of suburban area, its functions and determination of its boundaries. Efficient use of suburban areas is interesting, important and at the same time very complicated problem. In practice, it can be often observed that territories of suburban areas are used irrationally: there are wastelands, disposal sites, pits, warehouses, disordered groups of various buildings, deforested areas or development of suburban forest tracts, required for enhancement and recreation of city, industrial location results in depreciation of sanitation conditions of cities of mass recreation and tourism etc. The problem faces us is to develop a model of suburban area territory planning within the big city sphere of influence, which allows managing and using territories of suburban area a more efficient way.

4. Theoretical Part
Interpretation of the term of “suburban area” is mentioned in the reference materials. Thus, according to the Great Encyclopaedic Dictionary suburban area shall be understood to mean “territories adjacent to cities and are in close functional, cultural and social and another interaction therewith. Suburban areas are particularly developed around big cities and are a part of urban agglomerations. In big city suburban areas there are suburbs, satellite cities, recreational areas, agricultural lands” [11]. In Travel and Tourism Glossary suburban area is “a territory around city centre, functionally pertaining thereto in supply of goods and services, employment. Suburban area is often defined also as an umland” [12].

In the Ukrainian legislation and regulatory documents there are definitions as follows: according to the Law of Ukraine “On Regulation of Urban Development Activity” suburban area is a territory, supporting spatial and socio-economic development of city [13].

In the Ukrainian law draft “On Procedure for Agreement and Approval of Master Plans of Settlements” suburban area is defined as “an area of the city influence onto the adjoining territories and populated areas (within the administrative districts), together forming a single entity in functional and planning, social and economic and administrative and territorial structure and characterizing by intensity of transport links, circular migration, intersettlement servicing” [14].

According to the Ukrainian National Building Code “Territory Planning” central city and its suburban area are interrelated objects of spatial planning documentation at the stages of development of master plans of settlements. Suburban areas are determined for cities with a population exceeding 100 thou persons. The external boundary of suburban area of the biggest and big cities is an isochrone line 45-60 minutes proximity to the city limits by public transport [15].

In the strategy of demographic development for 2006-2015 suburban area is defined as a multi-functional socio-economic system, consisting of administrative districts, adjacent to the central population, which economic activity is focused on servicing and supporting needs of a city [16].

According to Popov V.K. “suburban area is a territorial area, adjacent to city limit, which is an integral part of city, created in accordance with economic, spatial, employment, recreation relations and fixed with a complex of administrative, city-planning documents.” [17].

M.M. Habrel in the monography called “ Improvement of Efficiency of City-Planning Solutions in Organization of Suburban Territories” gives a definition of the term as follows: “Suburban area is a territory, which surrounds city and creates a functional-spatial integrity therewith”. According to the author relations between city and suburban area are discovered in the system of the following relations: production – such relations occur in the line of production cooperative of the central city enterprises with the enterprises of the nearest inhabited localities; employment – these relations are
connected with population movement to the workplaces; cultural and social – relations related to the satisfaction of the suburban area population needs of social sphere; agricultural – relations occur as a result of catering services of the central city; infrastructural – relations related to the facility deployment of the city infrastructure in suburban area; recreational – these relations are connected with central city population movement to recreations [1].

V.O. Yatsenko territorially divides suburban area into subareas with various level common mutual regulation with city. (Figure 1.) [7].

Internal area limited by radius to 25 km is a territory of agreed interests of city and suburbs of all sphere of development. In the area there are on joint conditions of reservation of territories for house construction, service systems, transport support with organization of transfer hubs, recreation purposes, ensure of sojourn of city and suburban residents, industrial branches of city main enterprises.

![Suburban Area Zoning](image)

**Figure 1.** Suburban Area Zoning [7].

Middle zone is of 25 to 50 km radius. There will be production, recreation, scientific and research, specialized, treating activities, gardening and dacha co-operatives. Middle zone is a potential factor for reduction of migration processes from the city.

External zone is defined by the radius to 100 km. This zone is peripherical part of the agglomeration territory, where leisure facilities for long-term recreation are located, as well as agricultural enterprises, specialized production, scientific, medical establishments.

Territories of joint interests, where are no clear limitations, are formed along main transport corridors, take the first and a part of the second zone.

The author notes, that limits of suburban area may not be permanent, and in every certain case we take into consideration existing socio-economic status of territories, populated areas, urbanized regions, functional area of development, level of urban development, scope and interests of communities.
Among the key functions, carrying out by suburban areas, are production, agricultural, cultural and educational, natural-reserved, recreational, moreover, it serves as a reserved area for the further urban development [18].

Suburban area is closely related to the urban development and its influence onto the adjoining territories. V.D. Oliynyk and A.V. Hladkyy distinguish the following stages of suburban area formation [19].

The first stage (the end of the nineteenth – the beginning of the twentieth centuries). During this period suburbs have been formed. This process was facilitated by ecological safety of environment, opportunities for families to improve housing conditions, availability of private vehicles, development of public transport. This stage is described in terms of quantitative changes.

The second stage (1920-1960s). During this time period a necessity of self-sufficiency of these territories, including workplaces, production facilities and social infrastructure, gave rise to the development of suburban area. There are belts of suburban area with the functions peculiar therefor.

The third stage (the end of the 1970s). During this time period the process of the post-suburbanized environment creation has been carried out (the end of the 1970s). Factors of this process are defined by the insufficient reserve of city area, high prices for construction in city, high land rent, man-made load on the city area. Suburban area together with city becomes an area of “business activity”, its’ adjacent territories are built over with new business, cultural, shopping centres, new towns appear.

As is obvious from what has been said, development of suburban area is closely related to the process of suburbanization. Suburbanization (from Latin sub – under, neat and in Latin urbanus – urban) is a process of growth and development of suburban area of big cities, resulting in the formation of agglomeration, that is form of settlement, occurring on the basis of big city (or several cities) and creating a significant area of urbanization with the tendency towards joining neighbouring communities, and as a modern settlement system. Suburbanization is the further stage of urbanization. It is marked by the high rates of growth of population of suburban towns and satellite cities in comparison with cities – centres of agglomeration [20].

One of the key ideas of the suburbanization development was large vehicle-to-population ratio, which allowed to increase significantly free choice of residence with respect to work place and servicing, since people, who move, predominately continue to work in the central city.

The most vivid example of the suburbanization phenomenon was demonstrated in USA. Visions of scales of suburbanization in USA give the following numerical values. At the beginning of 1980s about 70 mln of Americans possessed own single-family houses. As a consequence of such housing system predominance, territories of populated areas, by some estimates, have been increased four times faster, that the population growth. Therefore, there was huge urban sprawl in USA.

First, suburban areas were formed solely as dwelling formations on the expectation of circular migration, in other words, their inhabitants should work in the central parts of cities, where were establishments and industrial enterprises. But thereafter production sector was moved from the centres of cities to the suburban area. This is especially true of various kind of offices, scientific, developing agencies, technological parks, university complexes, almost third part of which is now outside the city centres. Thus, according to H.M. Lappo, suburbs turned into enough independent “suburban towns” [21].

From 1960s onwards suburbanization spread to the European cities, which previously had been developed as compact territories with high density. Suburbanization was the most obvious in the British cities in comparison with the cities of the mainland Europe.

On the west the suburbanization process acquired a special form – construction in suburban areas of permanent marital homes and movement of essential part of city population thereto for permanent residency. After the completion of the socialist urban planning policy in 1990-1991, the cities of Central and Eastern Europe joined them.

In Ukraine the suburbanization process started in the second half of the twentieth century, and became especially noticeable during the last couple of decades. This process was supported by the
Development of motor transport, transport communications, change of living conditions of population, as well as construction of big shopping centres on the outskirts of the cities.

Development of suburban area in Ukraine, as in other countries of post-Soviet territory, is carried out in another way in comparison with the Western countries. City residents with higher incomes move to the suburban area in search of ecologically and socially safer environment. Or population with low income there for the purpose of strategy of survival implementation [22].

Among the main reasons of suburbanization in the world’s practice are much lower price for suburban housing; a lot better ecology; high price for good real estate in city; obsolescence and physical depreciation of buildings in the central districts of city; ecological, social, demographic problems; noise and pollution of air of big city by wastes and emissions of industrial production and CO2 emissions of vehicles.

It should be noted that processes that took place in the suburban area, might not always be tracked because of the change of administrative and territorial structure (when suburbs were included into city territories administratively and statistically as a part of central city).

In the monography “Urbanistic Ukraine: in the epicentre of space variations” there are types of suburban spaces as follows [22]:

- rural settlement, overtaken by suburbanization;
- new cottage estates, transformed into permanent dacha communities;
- satellite cities of Soviet times;
- districts of inner suburbanization.

Content of suburban area is defined by limits of territories, where the central city actively influences adjoining territories.

It is quite difficult to determine limits of suburban area. Limits cannot be permanent, they change together with the city development, development of transportation system, socio-economic status of territories and populated areas, level of urban development and interests of communities. Links between city and district take on particular significance. They are manifested in discrepancy between forms, depend on specialization of city and district, nature of settlement and population density, based on various forms of relations, which are combined and overlapped, creating a zone of influence of city.

I.O. Fomin defines limits of zone of influence of the central city by radius of intersettlement links: employment 15-60 km, cultural and recreational – up to 80 km [23]. Taking into account, that suburban area is an integral part of agglomeration, we shall agree to the idea of M.M. Dyomin, that “agglomerations shall be considered in the context of regional settlement system” [24].

Regional settlement systems are formed around centres – big cities, zone of influence of which has a hierarchic functional and space structure, which consists of four level of integrity: “initial”, “municipal”, “local”, “regional”. Radiiuses of the centres zones of influence are generated correspondingly: to “the initial” system 5-7 km; “municipal” – 12-20 km; “local” (interdistrict) – 40-80 km, “regional” (interregional) – 180-250 km. [25].

Commuter trips of population, which lives within agglomeration, are shown and combined in twenty-four-hour cycle of functions of workplaces, service sector and accommodation, and in the seven-day cycle these functions are supplemented by leisure time [26].

Employment and cultural and social relations are measured by streams of people and oriented predominately from places of residency to workplaces, establishments and enterprises of cultural and social services. They are relatively stable in space and in time, as a rule, localized within fixed territories and show a tendency to vary a little bit within twenty-four-hour and season cycles [27].

Recreational relations, in contrast to employment and cultural and social relations, have, as a rule, uncentered nature, since territories of mass recreation of population are organized and function in suburban area. There are so-called green zones, where are recreational facilities: forests, park-forests, lakes, ponds, rivers, special leisure areas are allotted, where are recreation camps, health centres, recreation houses, tourist camps, hotels etc. [28].
5. Proposals
During the development of project proposals related to the development of suburban area the authors propose to create a model of industrial area territory planning within the big city sphere of influence, which consists of the elements as follows:
1. Determination of limits of suburban area on the basis of employment, cultural and social, recreational relations between city and adjoining territory.
2. Determination of influence of a big city onto suburban area.
3. Having determined the limits, to determine of territories, being a part of suburban area.
4. To conduct analysis of existing condition of suburban area territories according to demographic, economic, ecologic parameters.
5. Giving proposals related to the spatial development of suburban area territories and determination of further directions for the development.
6. Development of urban planning documentation according to which it is possible to regulate processes, taking place in this territory.

6. Conclusion
Therefore, suburban areas are an integral part of big cities and agglomerations. Total area of suburban area depends on size of the central city of agglomeration, deployment of system of rural and urban settlements, engineering infrastructure, development of production facilities, ecological state, recreation territories, architectural and space-planning, sanitary requirements, specialization of farm enterprises etc. The proposed model gives us the key to more rational and efficient use of the suburban area territory.

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