

## Original Reserch Paper

# Explaining optimal model of urban development, with consideration of the influence of sphere effects in Boroujerd City

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**ABSTRACT:** Physical development of cities, especially in the second half of the present century, it turns out that habitable land under the influence of factors. The objective of the study is to explain the mechanisms affecting urban development in Boroujerd and its influence of sphere into a model. In this study, the effect of economic and social factors or mechanisms on Boroujerd's urban development and its regional penetration was studied. Employment and its diversity in Boroujerd city have led to the attraction of immigrants and the retention of the population in the city, which is largely dependent on the economic activities of workshops and industrial companies. Considering the urban structure of Boroujerd and also examining the theoretical foundations of the factors affecting urban development, which is referred to as a mechanism with the word mechanism, in general, economic as well as social and cultural factors can be used as an approach.

**Keywords:** Physical development, urban development, influence of sphere, Optimal model, Boroujerd city

**RUNNING TITLE:** Optimal Model Of Urban Development

## INTRODUCTION

Physical development of cities, especially in the second half of the present century, it turns out that habitable land under the influence of factors such as: population growth due to natural growth and migration from village to city, integration of villages in the physical context of cities, expansion of production units, services and Residential, changing land use patterns, land grabbing and mismanagement, etc. are reduced at an alarming rate. (Jabbari et al., 2010) Contrary to scientific findings, which indicate that the model of inclusive urban development around it is not effective, but this model and its models are still used. (Batexani & Yarnal, 2018)

Today, in discussing the formation of cities, their sphere of influence, and physical development of the city and its sphere of influence in the next stages, most planners and researchers, along with human factors, determine natural, climatic and geographical factors such as geology, ecology, and environment. They know. (Bahrain, 2012). Environmental and climatic elements along with other environmental factors are the most important factors in the formation and development of cities and the continuity of urban life (ataei & fanaei, 2015: 61. Sarvar et al, 2015) in a study believe that the natural features of the region, opportunities Provides a lot for the physical development of the city (Rosta et al, 2014) in a study and concluded that the most important natural factors affecting the development of

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cities are topography, land slope, climate, geology, hydrology, and geomorphology. The importance of the sphere of influence and the establishment of urban-rural relations in Iran's urbanization has always been accompanied by many fundamental and side issues. The sphere of influence of a city does not have a definite and definite limit, but it is presented as a spectrum of the intensity of relations between the city and the surrounding areas. The farther we get from the central city, the less intense these relationships become. In some cases, depending on the geographical conditions and communications and performance of a city, it may appear as separate spots. Spheres of influence are the area around the city, which has more of a functional relationship with the main city. (Rahmani, 1398) Using the concepts of functional area and different socio-economic areas, urban planners have tried to describe and define the urban area in some way. Green used information about the origin and destination and the number of daily buses to determine the city's sphere of influence. "Crystal" and "Lush" used deductive methods in this case and focused their studies on the analysis of hierarchical relationships of population units. The general definition of an urban area often includes several urban locations and is an objective embodiment regardless of political boundaries (Geurs, Ritsema, 2018). It can be said that an urban area is a system of large and small cities that are located in a geographical area with a specific political and administrative area, or an urban area is composed of a number of cities, the largest of which is called the mother city or city location. (Abedini, 1998) Farter, 2010 in his research Earth factors (Amoateng et al, 2013) believes that the physical development of cities and the development of the surrounding area is influenced by human activities and land uses in cities and landscapes (Richard, 2002) in his research on the role of communication. He considers transportation to be effective in urban development and its sphere of influence and believes that in areas where communication is easy, more urban centers are formed and developed. Partsa, prasad, (2012) believe that local landforms have historically played a key role in the location of settlements and their future development is

influenced by regional geomorphology. Thus, urban development is influenced by natural, environmental, economic, social, and political processes that have gone through various stages throughout history, and the sphere of influence of cities develops over time. Due to the conditions of time, these factors may act at different levels of local, regional, national with more power and influence than other factors and special mechanisms and cause changes and development of the physical fabric of cities. Urban areas, depending on their size and function, will have a wide gravitational pull and will inevitably form relationships with their surroundings. Considering the evaluation and analysis of development mechanisms and the formation of Boroujerd city and specifically emphasizing its sphere of influence, explaining the structure of the city and the dimensions of urban growth is the most important issue in the first step of extracting the model and correcting it. It is more important. In addition, by determining the combined research method to achieve the best and fastest result in this subject, it can also lead to a suitable research model that can be used in topics such as development and urban spheres of influence. Finally, explaining the development model and the conceptual framework of the sphere of influence for the city of Boroujerd has a methodical innovation in the phenomenon of exogenous development..

**Tab 1:** Summary of internal and external applied research related to the explanation and analysis of mechanisms affecting its development, formation and sphere of influence in three scales and common cases

Researchers	Year	Functional Scale			Research Type		Subject	Research realm	Findings
		Macro-scale	Middle-scale	Micro-scale	Fundamental	Functional			
Nasiri	2002	-	*	*	-	*	Malayer city development process	Urban planning	The dominance of the radial-checked pattern for the modern texture of Malayer city
Pour Ahmad and ect.	2007	-	*	-	-	*	Investigation of Sanandaj urban development trend and pattern using GIS	Urban planning	The appropriate model of urban development has been determined by locating an area of 11 square kilometers in the northwest of Sanandaj.
Nazarian & Tavalayi	2007	*	-	-	-	*	Determining the direction of physical development of Andimeshk city using RS and GIS satellite data	Urban regional planning	Predicting for the physical development of the city, factors such as: distance from the city, distance from the road, distance from industrial centers, the existence of fault lines, slopes, bumps and canals, have been determined to expand the city of Andimeshk.
Bezi	2007	*	-	-	-	*	Analysis of urbanization trends and physical development of the city	Urban planning	The emergence and dynamism of Zabul city is due to regional and trans-regional conditions and the greatest physical development of Zabul city is due to the conditions created after the revolution.
Mousavi and ect.	2011	*	-	-	-	*	Modeling physical development and determining the optimal location for housing the population of Sardasht up to the horizon of 2022	Urban planning	The bed and geographical space of the city in terms of natural-environmental conditions, will not have the potential to accommodate the population to the horizon of development. The city is surrounded by natural and geomorphological features of the surrounding area on the one hand and severe shortages of the city in terms of per capita uses, equipment, facilities and facilities and services on the other hand, up to the horizon of 1400 cities face serious limitations.
Rezaie & Oghli	2011	*	-	-	-	*	Investigation of Tehran metropolitan area of influence by time method and gravity model	Urban planning	The results show that cities closer to Tehran have the most impact from Tehran and also the south, southwest and west of the city, due to ease of access, population concentration and economic activities have the greatest impact in urban areas of Tehran.
Hosseini and ect.	2012	*	-	-	-	*	Evaluation and location of physical development aspects of Diwandara city using fuzzy logic model	Urban planning	Natural parameters are one of the main factors determining the direction of physical development of cities and settlements. The results of this study show that there are areas conducive to the future physical development of the city of Diwandara more in the eastern part and to some extent in the north and southeast.
Hosseini and ect.	2014	*	*	-	-	*	Location for physical development of Rasht city with		By using the geographic information system, the best lands for the future development of the city-centered south of the city, ie the area of Lakan Boulevard, have been identified.
Hamid reza Saremi	2015	*	*	-	-	*	Investigation of development from inside Boroujerd city	Urban planning	Existence of intra-textile lands, optimal physical-spatial expansion and provision of housing within the framework of the philosophy of inner-city development is possible and can be useful.
Mohamad Rahmani	2017	*	*	-	-	*	Investigation of Hamedan city of influence based on the theoretical model of separation point and interaction	Urban planning	The results show that as the population and distance increase, so does the penetration rate.

Mahmudzadeh & Zarghami	2018	-	*			*	Application of LTM model in forecasting and modeling the physical development of Ilkhchi city	Urban planning	The results show that using the 12 indicators identified in the research, the urban development map is predictable and the existence and protection of natural resources as urban green infrastructure can be vital in urban development and sphere of influence.
Vahedi & Sahra navard	2019	*	-			*	Determining the sphere of influence of Khorramabad city in Lorestan province by Huff method	Urban planning	The results show the greatest effect of physical index on urban sphere of influence and then service, economic and social indicators have been effective, respectively.
Longhu	2001	*	-	-	*	-	A Study of the Urban Development of Latin American Cities and Its Impacts	Urban planning	Urbanization processes are often delayed in Latin America, and have been replaced by the traditional effectiveness of large cities with a highly centralized pattern as capitalist relations expand.
Fris	2003	*	*	-	*	-	Smart city growth	Urban planning	The results indicate the formation of the basics of morphological factors and emphasis on natural and geographical factors.
Anderson	2005	*	*			*	Internal development Challenges and opportunities Examine the internal development of the city and the obstacles and opportunities ahead	Urban planning	Explain the factors and internal relations in the form of economic, physical, social and service pairs.
Betrlas and ect.	2011	*	*			*	Study of favorable areas for urban growth in three Greek cities	Urban planning	The results indicate that there is no coordination between the growth direction of the studied cities and the designated favorable areas. They introduced the cause as economic and social factors that have so far determined the growth direction of cities.
Blance	2017	*	-	-	*	-	Investigating the economic and physical impacts of urban spheres of influence in Angola cities	Urban planning	In the study of general factors, economic factors affecting urban development in the cities of Angola are its most effective indicators.
Grific	2020	*	*	-	*	*	Paris and its suburbs	Urban planning	She concludes that factors affect not only the width of the city of Paris, but also the inner layers and their length.
Rafi khan & Shahrzad	2021	*	*	-	*	*	Sphere of metropolitan urban influence in Israel	Urban planning	The results indicate the need for a detailed explanation of the methods and models shaping urban growth as well as the methods used.

In a general view, the mentioned foreign and domestic researches can be examined in the focus of the present research in several cases, so that most of the mentioned researches:

1- Most of the domestic researchers have not done research by examining the factors of urban development in dealing with the subject of methodology and also choosing the specified path according to the course of the research background. The context and type of approach are discrete

2-The structure of internal research, in addition to the course of the principles in each, is also very different in terms of geography, so that researchers do not have adequate coverage of the research background of others along with their views and explanation of the theoretical framework.

3- Considering the existence of a suitable structure in the course of principles and also explaining the influential factors in urban development as well as the sphere of influence in foreign researches, the methods explained in general are of different scales and scientific context, which is important for the current dissertation on content continuity will be difficult to smooth out. As a result, according to the background of the mentioned research, in the present study, an innovative look and introduction of a more accurate model and evaluation methods for the concept of urban sphere of influence in the context of urban development model will be attempted according to this model and research framework. The appropriate method to obtain and the results in

the form of a strategy to control and develop exogenous urban development to be presented. The main purpose of this study is to explain the mechanisms affecting urban development and its sphere of influence. In the present study, we try to answer the questions that are more on the question mechanism and the relationships that form the main concepts, so that the optimal model of these relationships in urban development and its sphere of influence can be explained: - What are the factors affecting urban development and its sphere of influence? - The formed urban structure of Boroujerd based on the prioritization of which mechanisms has had the most effective growth and sphere of influence?

### **MATERIALS AND METHODS**

In terms of structure, the research is analytical-descriptive, which in terms of the main purpose, is a type of applied research that can be considered exploratory approach to the concept of urban sphere of influence in the context of development model due to the lack of previous research. The method of data collection has been done in a library using statistical data, reports and also approved plans of Boroujerd city. In the following, according to the expression of the subject and purpose in the form of a conceptual framework, the subject of urban development and sphere of influence is considered, the factors and mechanisms affecting them are mentioned and also explained as a research framework.

The sphere of influence of a city does not have a definite and definite limit, but it is presented as a spectrum of the intensity of relations between the city and the surrounding areas. The farther we get from the central city, the less intense these relationships become. The sphere of influence is the area around the city, which has more of a functional connection with the main city. With the residents of the settlements located in it, in order to enjoy urban services (school, clinic, sales, etc.), they have to go to the main city on a daily basis (Ziari, 1999). Sometimes, depending on the geographical conditions, communications and performance of a city, it may appear as separate spots. The extent and radius of influence of the sphere

of influence is determined by the role of the city, the order of the city in the hierarchical system of the city, geographical factors such as roughness or other natural features, and finally the ease of access. In addition, the distance to the next city is also effective in explaining the sphere of influence of a city. The term sphere of influence represents the field of influence and influence of social, cultural, economic and political services of a city in villages, village-city, towns, districts, small towns adjacent to it. It is natural that this field of influence can help by increasing the definition of the sphere of influence by increasing the definition of the sphere of influence of a city:

- Supply of urban goods and procurement of artifacts made in the city
- Providing medical services in the city
- Providing services and repairs available in the city
- Communication network and passenger and freight transportation facilities

It is worth noting that with the development of communications and mechanization and other vehicles, the political-administrative boundaries and the definition of urban spheres of influence are reduced day by day, and it is not possible to determine urban spheres of influence by geographical boundaries. Cities mainly have general and specific spheres of influence or direct, moderate and weak spheres of influence. The general sphere of influence of a city that is related to other cities may be affected by the appropriateness and intensity and weakness of different urban functions, but the specific sphere of influence is more in a close radius and the current relations and current mutual needs. It does mainly with the same city (Ziari, 2009). The scope and radius of influence of the sphere of influence is determined by the role of the city, the order of the city in the hierarchical system of the city, geographical factors, and finally the ease of access. In addition, the distance to the next nearest city is also effective in determining the sphere of influence of a city. The term “sphere of influence” refers to the field of influence

and influence of social, cultural, economic and political services of a city in villages, village-city, towns, districts, small towns adjacent to it. It is natural that this field of influence is adjusted with increasing distance and almost disappears until it reaches the border of one city as another. The importance of the sphere of influence is that sometimes it determines the role of the city and shapes it. The size of the sphere of influence of a city is also related to the multiplicity of its role and amount. That is, the more roles a city has, the wider its sphere of influence. And the more power it has in guiding the region, the wider its influence will be in the region, and the greater its radiation radius in the fields of finance, transportation, communications and other services (Farid, 1996).

Until recently, the physical development and population growth of cities had a coordinated and balanced increase, but with the emergence of new developments, cities quickly accepted changes and transformations. These changes have been in the form of population growth and physical expansion of cities. But in the form of this physical expansion, there has been no balance. In fact, there has not been a reasonable proportion between urban land uses and the allocation of land and urban per capita. Cable (1969) defined physical development as the performance of construction, engineering, or any other operation on the surface or basement, or any significant change in the use of buildings or land. Physical development involves any human operation or modification on the ground in an effort to create a livable and comfortable environment. Physical development manifests itself in the form of human activities or land uses in cities and towns (Amoateng et al., 2013). Therefore, the physical development of the city is a dynamic and continuous process during which the physical boundaries of the city and its physical spaces in the vertical and horizontal directions increase quantitatively and qualitatively, and if this process is rapid and unplanned, it is uncoordinated. Balanced and unbalanced physics will not lead to urban spaces and as a result will cause many problems for urban systems (Ferdowsi, 2005). Physical development of cities is a dynamic process that is done by making changes in the physical

space of the city in a vertical and horizontal direction. If this process is done unplanned, the physical balance of the city and the environment will change and soon the urban system will be unable to perform its tasks properly (Valikhani et al., 2011). Factors and mechanisms affecting urban development with a focus on urban spheres of influence. The speed and pattern of external expansion of the city and consequently its degree of stability is affected by a set of economic, physical, legal and ownership factors, political, transportation and communications. Each of these factors somehow accelerates and encourages or limits the expansion of the city to the surrounding lands. The most important factors affecting the development model of the city were classified into five components, which are divided into two categories; A) Development stimulus (including economic, socio-cultural and managerial-political components that guide development (including spatial-physical and environmental components), we will explain these factors in the following.

In general, the main factors affecting urban development with a focus on urban sphere of influence can be examined in the following cases:

- Environmental factors
- Geopolitical factors
- Physical-spatial factors
- Management factors
- Environmental factors
- Economic factors
- Social and cultural factors

Environmental factors: Environmental factors, physical factors of nature, is a major and constructive element of the city and is the first bed in which the artificial environment is formed. (Davkinz, 2019) Therefore, the natural structure of the urban environment is one of the external factors that play a key role in the development and expansion of cities. Existing natural facilities such as

favorable topography, existence of sufficient land, regional location of the city in terms of location in the communication axes and population centers of the region and the country, each is a kind of effective factor in the physical development of the city. Geopolitical factors: Geopolitical factors in line with goals such as stabilization of borders and security of border areas, facilities of military centers and defense industries can play an important role in the physical development and expansion of cities. On the other hand, the provision and establishment of military centers, as well as the existence of industries and factories that have a defense aspect, can play a role in the physical development and expansion of cities. (Mohammadi, 1398)

#### *Physical-spatial factors*

Urban land use and consequently urban spaces is one of the most important issues in the physical development of the city because urban land use is how land is used and the function that is assigned to it, this function may be at the regional scale or at the scale Human settlements and the city. (Jafari Mehrabadi, 2009) Looking at the process of physical development of cities, especially in the second half of the twentieth century, it turns out that a limited element called land (habitable lands) under the influence of factors such as population growth ( Natural growth and migration), integration of villages in the physical fabric of cities, expansion of large numbers of production, service and housing units, changing land use patterns, increasing human greed, land grabbing and mismanagement, etc. are decreasing at a staggering pace. Find. Given the principle that no city can have an existential cause unless the actual or potential environmental resources provide the conditions for its development, following the rapid physical growth of biological complexes, a large part of the best, most suitable and of course the most valuable immediate land Cities - which have long been necessary and sufficient environmental conditions for human accumulation in them, are exposed to destruction (Mohammadzadeh, 2008) Suburban topography may not be suitable for urban development. The growth of Pirashahr with continuous texture can be

interrupted due to physical obstacles such as rivers and water masses, coast, steep slopes, swamps, hills and valleys, etc. There are lands that are difficult to build and cannot be built naturally.

#### *Management factors*

Political institutions from the national to the local level play an essential role in the speed and direction of urban development through the implementation of urban development plans, land use determination, land tax and construction, zoning and restrictions for disturbing industries; Also, the expansion of public services such as: electricity network, piped water, sewage, land preparation measures, which are often carried out by governments in new urban areas and suburbs, motivate the development of the surrounding city (Bastieh, 1991). Political factors such as political divisions and the creation of connected and separate settlements play an influential role in the development of cities. Political divisions and the location of a region in a higher political position, makes the region attract more financial resources and facilities and equipment. This factor creates urban attraction in the region and paves the way for migration movements to the city (Rezaei, 2005). Also, geopolitical factors in line with goals such as stabilization of borders and security of border areas, the establishment of military centers and defense industries. To play an important role in the physical development and expansion of cities. Therefore, one of the methods to ensure the security and stability of each country's borders, in addition to political and economic stability at home, depends on the establishment of commercial and residential centers in the border areas to meet the housing needs of military and law enforcement forces, border stability and security Due to the existence of commercial and economic activities caused by housing, and on the other hand, the provision and establishment of military centers such as barracks, military training centers, as well as the existence of industries and factories that have a defense aspect can develop and expand physically cities. Have a role. (James. 2017)

*Environmental factors*

The environmental factor, the physical environment of nature, is a major component of the urban space and is the first context in which the artificial environment is formed, in which the interaction between human societies and their environment can affect the urban space in two ways. On the one hand, natural space affects the physical and social qualities of human space and on the other hand, human societies have affected nature with the development of urban space, which throughout history, the impact of this nature on the physical quality of urban space can be seen. Especially in the case of early human settlements and agricultural communities Rozi and also in newer cities of the industrial period, where the shape of the city was strongly influenced by factors such as climate, topography, water resources and arable land. A comparison of habitats built in the mountains and flat lands, between hot and cold climates and those built along the river, with those built at the foot of the mountains, will show that the artificial form can be closed. To change the conditions of the natural bed (Mozini, 2002) Therefore, the natural structure of cities is one of the factors that play a key role in the development and expansion of cities. Existing natural facilities such as optimal topography, sufficient land, regional location of the city in terms of location in the communication axes and population centers of the region and the country, each is a kind of factor affecting the physical development of the city. In case of the above factors and the continuation of facilities such as land and water, cities will be able to develop physically (Azizi, 1394)

*Economic factors*

Knowledge of the structure and operation of a city's economy is necessary for urban planning and land use analysis. Studying the economic fundamentals of these activities and how a city has developed and what it is like today and what it will be like in the future is an effective guide. In general, economic activities cause employment and attract population to such centers. Therefore, it can be said that the economy of a city is an effective factor for land development. Basically, the causes of

the emergence, development and prosperity of cities are, above all, economic. The degree of evolution of economic construction, or in other words the level of social division of labor, has a direct impact on the organization of space; Thus, the social division of labor in its higher stages has led to the emergence of different spaces that trace the course of history and with the evolution of society, the economic structure in general develops more and the level of social division of labor increases and the rejection of any part of the economy becomes more important. Finds (Salehi, 1397) from an economic point of view, in addition to the important effect of the growth of economic indicators in accelerating the development of urbanization, when the establishment of families and businesses in the urban-rural suburbs has economic justification, uncontrolled urban development to It will happen around. In this situation, access to cheap land on the outskirts of the city is of particular importance. The low cost of land that is expected to thrive in the future can attract urban growth.

Social and cultural factors: It can be boldly said that social factors and population are the most important factors that cause rapid urban development. So that the development of the city is closely related to the growth rate of urban population and in this regard, the natural increase of urban population, the rate of net migration to the city, the transfer of non-urban communities to the city and the construction of urban population are the main factors. Today, the proper distribution of population in the geographical area is of great importance in the field of policy-making and planning in the world. Many developing countries have over-concentration and overcrowding in a few urban areas. Such a situation leads to many problems in urban management, especially the provision of urban infrastructure. (Smith, 2017)

It is safe to say that social and cultural factors are the most important factors in the rapid development of cities. So that the development of the city is closely related to the growth rate of the urban population and in this regard, the natural increase of the urban population, the rate of net migration to the city, the transfer of population construction of non-urban



communities to the city and urban population construction are the main factors. (Azizpour, 2006) Therefore, introducing the city from the point of view of population, density or physical characteristics alone is not enough. Rather, the human aspects of the city form its main nature (Hekmati and Kabir, 1375). Natural spaces hardly go to infrastructure abnormally. The central areas and the old textures and the main cores of the city are under pressure from new consumption patterns, especially transportation. With the growth of population and consequently with the rapid growth of urbanization and urbanism, social relations in cities are transformed and the traditional relations of the past are transformed by the dynamic conditions of urbanization that these changes affect the network of cities and In order to improve and expand social relations between metropolitan residents and create the necessary facilities for the lower classes of society and for the growth and flourishing of their talents and creativity and their use of social facilities on the one hand and to create the necessary coordination to provide social services. On the other hand, the development and construction of residential centers in cities has been proposed, which has led to the physical development of cities; We can also mention the

role of marginalization in this field, which is achieved following changes in the economic and social structure of cities and villages; Therefore, in general, urban attractions and rural repulsions increase the population of cities and consequently their physical growth and physical development (Mohammadi, 1996). Considering the urban structure of Boroujerd and also examining the theoretical foundations of the factors affecting urban development, which is referred to as a mechanism with the word mechanism, in general, economic as well as social and cultural factors can be used as an approach. Current research and in the form of selected variables using other methods as a research framework.

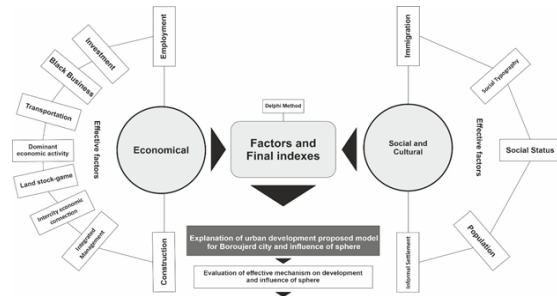


Fig 1: Structural model of mechanisms affecting urban development and its sphere of influence

Tab 2: Conceptual model explaining the mechanisms affecting urban development and Boroujerd sphere of influence with emphasis on effective default factors

Categories, factors and indicators in explaining the proposed model of development of Boroujerd city and its sphere of influence		
Category of mechanisms	Proposal Factors	Research main indexes
Economical	Employment	Employment rate
	Investment	Establishment of companies and industrial workshops
	Land stock-game	Land stock-game ratio
	Dominant economic activity	The rate of economic activity governing the city
	Black Business	The rate of increase in the blocked price
	Integrated Management	Management structure
	Transportation	Travel rate
	Intercity economic connection	The rate of economic exchange
	Construction	Construction ratio
Social and Cultural	Informal Settlement	The rate of informal settlement and marginalization
	Immigration	Immigration rates
	Population	Population growth rate and its natural growth
	Social Status	Social topographic structure
	Social Typography	Ethnic structure of urban textures

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