

Nada Rajic, Ph.D., City office for Strategic planning and development

The position and demographic significance of Zagreb at the crossroad of the regions of Central and Southeastern Europe

Key words: Zagreb and the surrounding area, Zagreb region, demographic development, transport corridors

Abstract

Geotransport position of Zagreb provided him an opportunity to create a transport crossroad of European significance with important transport functions, which has been, for a long time, an important precondition and incentive for its demographic and economic growth.

This paper reexamines the significance geotransport position of Zagreb and the Zagreb region in interconnection with his demographic development during one hundred year ago.

It shows changes in the ranking of towns based on their size (from Zagreb to other more important towns in the Danube-Mediterranean inter-space) in the regional area of around 250 kilometres in the period from 1910 to 2015. In addition to changes in rank-size, it also presents relative relationships in the size of such towns via rank reciprocity indicators. In further text, it also presents the current demographic significance and importance of Zagreb in the urban network of Croatia by applying the rank-size rule and the urban primacy index.

By observing the demographic development of Zagreb over a longer period of time, it is confirmed that it is indubitably interconnected with the movement of the population, traffic and overall development of its neighbouring settlements and wider regional environment.

Finally, this paper presents the main reasons why Zagreb and its neighbouring areas have experienced such a precipitous demographic growth in the course of this period. The answer lies in the interconnectedness of its demographic and geostrategic position, transport, economic, and overall social growth and development, although it proceeded at a different tempo in certain phases of the long-term historical period. Ever since the establishment of the Zagreb Diocese (1094), Zagreb's *genius loci* has been an important and ongoing factor in attracting settlers to this area, a long time before modern censuses.

At the end, the paper presents conclusions and some proposals for the transport, economic, and overall city-regional policy of development.

1. Introduction

From the moment of their emergence, towns are a place where people can gather, the centre of cultural, economic, and social events, a place to exchange knowledge, experiences, and the products

of work, a place in which, despite numerous problems pertaining to the development of large towns, it is still possible to achieve the best quality of life.

Traditionally, each town is a place where significant funds and networks of various influences are concentrated and if that location is naturally in a geostrategically more favourable position, at a crossroads, the better the preconditions for its growth, although modern towns in normal geopolitical settings and circumstances must be open towards the outside influence.

Further to historical sources, Hungarian King Ladislav Arpadović, having conquered the then Posavska Hrvatska, founded the diocese in Zagreb around 1094, to be more precise, in the second half of 1093 and the first half of 1095.

From its beginnings in the Middle Ages, Zagreb was a fortress that was granted privileges¹ guaranteeing unhindered development, outside the influence of the powerful secular and church authorities of the time. That was the necessary incentive to encourage the beginnings of trades and crafts and the arrival of settlers from all directions, a long time before the modern censuses.

The aim of this paper is to present the fundamental connection between the position of Zagreb and its historical, and modern, demographic development and significance in relation to towns both within its city region and in Croatia as a whole, and in the wider regional European settings.

The subject matter of research includes the examination of Zagreb's location as a factor in demographic growth and development and the position of Zagreb based on size among a dozen important towns in the Danube-Mediterranean inter-space, a comparison and changes between 1910 and 2015. Then, following a presentation of basic data and spatial terms used in science and political practice in the Zagreb area, with focus on the role and significance of the Croatian capital, it shows and explains the connection between the existing road network and the degree of urbanisation of settlements and the significance and special characteristics of Zagreb as the centre of its own region and of the state in the Croatian urban network.

Further, after a presentation of very exponential growth of the population of Zagreb and its region in the period from 1857 to 2011, certain proposals for improving the Croatian transport system and stronger integration in the wider European transport system are provided, as well as for implementing the overall city-regional policy of development, which could result in the future in more favourable demographic and total development of the city.

2. Geotransport position of Zagreb as a factor in demographic development

The advantageous geotransport position of Zagreb has enabled the city to develop a traffic node with important traffic functions, and this, together with a naturally flat landscape and a favorable climate, are attractive factors for settling from the earliest times.

¹ In the deed of Archbishop Feliciano in 1134, the Bishop of Zagreb is presented a gift of the Dubrava forest, given by King Ladislav at the founding of the Diocese. The original deed is kept in the archives of Zagreb's Archbishop and its most important part reads: „*Regnante nobilissimo rege Ladislau..., rex divina gratia inspirante zagradiensem... constituit episcopatum...*“ (During the reign of our very noble King Ladislav... inspired by the grace of God, the King founded the Zagreb Diocese...).

From a traffic point of view, Zagreb's transport intersection is found at the place of contact of large European geographic regions that include European transport routes, enabling connections with more remote European corridors.

The area of Zagreb and its surrounding area is an intersection of longitudinal and cross-sectional routes of inter-regional European significance connecting Central and Western Europe with the countries of Southeastern Europe, the countries of the Pannonian and Mediterranean regions, and the Near East. Old Croats put it quite nicely: „Zagreb is the advance-guard of the East towards the West or, if you will, the other way around as well: the advance-guard of the West towards the East“².

Zagreb's coordinates are 15° 58' 52" E and 45° 48' 43" N. This favourable geographic position, sheltered by the Medvednica mountain, also influences the climatic conditions in this area.

In the valuation of Zagreb's transport intersection, the primary significance goes to the connection between the Danube Region – Adriatic, since Zagreb is located in the area where the central Danube Region is closest to the Adriatic Sea³. The air distance between Zagreb and the nearest point on the Adriatic coast is only 120 km and to Rijeka 130 km. On that route of connecting Zagreb and Budapest, the dominant relief elements in Central Croatia and the neighbouring Hungary (“Direction Balaton”) direct and facilitate movement. In the early 21st century, it takes 3-4 hours from Zagreb to reach the Adriatic and the territory of the neighbouring countries of SE Europe.

Thanks to the exceptionally favourable geographic position, Zagreb's intended role is that of a concentration in relation to transport connections from the western, central, and southern parts of the central Danube region towards the Adriatic, other Mediterranean countries, and Southeastern Europe. The advantages of the geographic position of Zagreb arise from the fact that in its hinterland there are countries without access to the sea (Austria, Czech Republic, Slovakia, Hungary) and the most important transport connections to the Danube metropolitan cities go through Zagreb: Vienna, Bratislava, Budapest, and also important ports in the northern and central Adriatic coast. A much wider area gravitates towards the Adriatic via those countries, all the way to the Baltic area and Ukraine. Further, Zagreb's concentration role is strengthened by trans-Alpine and peri-Alpine connections that begin in the north-western part of Europe, leading towards Europe's south-east.

Apart from such favourable natural geographic position on the development and valuation of the Zagreb transport intersection, there were also social and economic, as well as political interests that were pronounced in this area over a long historical period.

Zagreb begins to develop more significantly only in the second half of the 19th century with the construction of railways, first with Slovenia, and later with Sisak, Karlovac and the wider region of central Croatia, and the beginning of the strengthening of connections with Vienna and Budapest.⁴

² Vj. Klaić, Zagreb, naklada knjižare Jugoslavenske akademije L. Hartmana (Stj. Kugli) Kr. Sveučilišna knjižara Franjo Župan, Zagreb, 1913, p. 2.

³ Sić M., *Razvoj i perspektiva Zagreba kao prometnog čvorišta europskog značenja*, *Geografski glasnik*, Zagreb, 1994., p. 131.

⁴ In the second half of the 19th century, railways were commissioned as follows: Zidani most – Zagreb – Sisak, 1862, Zagreb - Karlovac 1865, Zaprešić – Varaždin 1885, and Dugo Selo – Novska 1877.

Later development of transport in Croatia and in the area of Zagreb and its surrounding area at the time is the result of the interest of Austria's and Hungary's transport policy, the aim of which was to exploit Croatia and expand the political interests to the countries of Southeastern Europe. At the time, Zagreb stands out as the most important urban centre of central Croatia and the wider region.

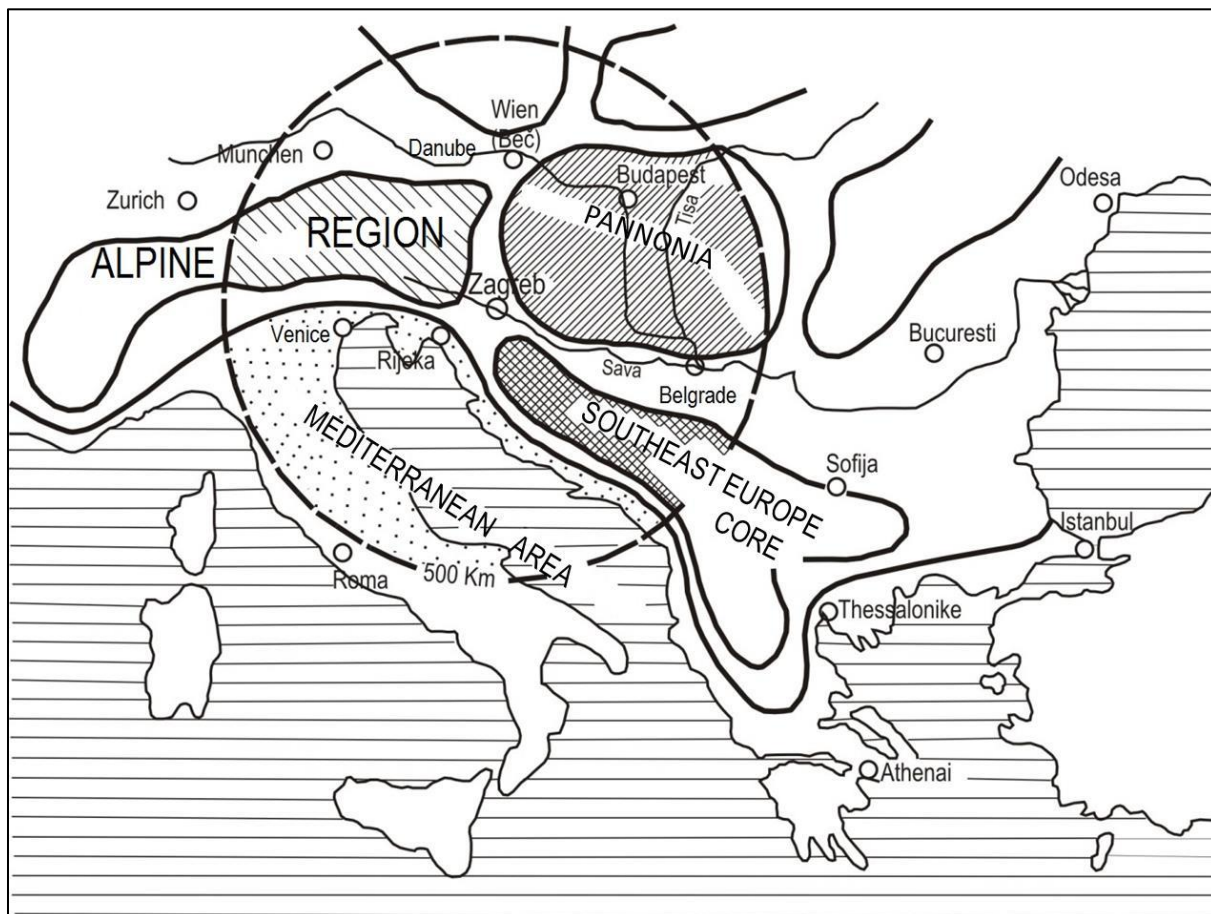


Figure 1. Position of Zagreb at the intersection of large geographical regions of Europe

After the founding of the first Yugoslavia in 1918, the directions of further traffic development change. Zagreb, however, remains closer to the European economic centres than any other town in the new state. That was the phase of initial development of Zagreb's industry, its cultural and social progress, and also of gradual demographic growth.

In the new Yugoslav state after World War II, the transport policy changed to a certain degree. Zagreb became the most important transport intersection in the western part of former Yugoslavia, this is true enough, but throughout the second half of the 20th century the transport policy did not make it possible for Zagreb to become the transport intersection, which its natural and geostrategic advantages permitted. The orientation of transport mostly focused on connecting Zagreb with the east, as evident from the fact that most motorways at the time were constructed east of Zagreb.⁵ In

⁵Sić M., *Prometno značenje Zagreba* (Transport Significance of Zagreb), Geografski horizont, Zagreb, 1994, p. 39.

the Yugoslav state, in the conditions of competition by and between internal transport centres and restrictions imposed by political reasons, Zagreb could not affirm itself as the leading transport intersection despite its geostrategic advantages.

Following Croatia's independence, as of 1990 onwards, the conditions for valuing Zagreb's transport intersection change considerably. Thanks to its central position in relation to the main areas of the Croatian territory, and the level of its transport development, Zagreb has become the most important transport intersection of the new independent state and assumed the role as the main point of internal transport connections. The transport-geographic position of the Zagreb intersection over the past decade has not experienced the affirmation it deserves in full. The prevailing reason is the war in the territory of the former Yugoslavia, which led to a substantial decrease in the volume of commodities trade across Zagreb following re-routing to other neighbouring routes. Despite such difficulties, the Zagreb – Rijeka motorway, and the motorway towards Krapina, Varaždin, and Goričan as well as towards Zadar and Split was constructed in the period from 2000 to 2008.

However, the transport policy of the European Union in the early 1990s was not in favour of the Zagreb intersection. Still, the position was corrected in the decisions of the Pan-European Transport Conference in Helsinki in 1997, at which Croatia was included in the network of European corridors. According to those decisions, there are three pan-European transport corridors passing through the Croatian territory (V, X and VII), but the completion of the project of building the Adriatic-Ionian motorway creates the possibility of the opening of a fourth pan-European transport corridors across Croatia.



Figure 2. Trans - European transport network - TEN-T core network corridors, European Commission

The Zagreb transport intersection is directly included in the direction of longitudinal European connections (west-east, northwest-southeast), ie, in the pan-European corridor X Salzburg – Ljubljana – Zagreb – Belgrade – Skopje – Solun, with branches Graz – Maribor – Zagreb (X.a) and Niš – Sophia – Istanbul (X.c).

The pan-European corridor X, connecting Western Europe with Southeastern Europe and the Near East, coincides completely with the Croatian Sava corridor Bregana – Zagreb – Slavonski Brod – Lipovac, which is the most important axis of development in the Zagreb and wider Croatian area, especially for the region of Continental Croatia, in which Zagreb and its city region is the main axis of development. Together with the pan-European corridor V and its branches towards Maribor and Split, it determines the basis of Zagreb's development as a transport intersection of national and European significance.

Zagreb joins the transversal European Mediterranean corridor across the pan-European corridor branch V.b, the Mediterranean corridor: Kiev – Budapest – Zagreb – Rijeka – Ljubljana – Trieste – Venezia – Verona – Milan – Turin – Lyon – Barcelona. The pan-European corridor V connects western Mediterranean with the Pannonian Valley and the Pridnjepar Belt. The branch Rijeka – Zagreb – Hungarian border is Croatia's main transport and development axis. Air transport in the Zagreb International Airport is on the rise (as of 2016) and the airport has gained importance after the expansion of the take-off/landing strip and the construction of a new passenger terminal.

The favourable transport-geographic position gives Zagreb an exceptional place in the system of European conurbations and large cities, but also in the integration of Croatian national space.



Figure 3. Transport corridors and development axis in the territory of the Republic of Croatia

The true connectedness of the geotransport position of Zagreb and its demographic development during the changes of the political and economic circumstances over more than one hundred years (1910-2015) is visible from a comparison of its size to that of other important towns in its regional surroundings within a 250km radius (Table 1):

Table 1. List of important towns/cities by size in the Danube-Mediterranean Inter-space 1910, 2011 and 2015

1910			Movement index
Rank	Towns/cities	Total number of inhabitants	
1	Vienna	2,031,000	
2	Budapest	880,000	
3	Trieste	229,000	

4	Graz	152,000	
5	Zagreb	79,000	
6	Rijeka	50,000	
7	Ljubljana	47,000	
8	Klagenfurt	29,000	
9	Maribor	28,000	
2011			Index 2011/1910
Rank	Towns/cities	Total number of inhabitants	
1	Budapes	1,700,000	193,2
2	Vienna	1,699,000	83,7
3	Zagreb	790,017	1000, 0
4	Ljubljana	275,000	585,1
5	Graz	250,000	164,5
6	Trieste	211,000	92,1
7	Rijeka	128,600	257,2
8	Maribor	113,000	403,6
9	Klagenfurt	92,000	317,2
2015			Index 2015/2011
Rank	Towns/cities	Total number of inhabitants	
1	Vienna	1,797,337	105,8
2	Budapest	1,759,407	103,5
3	Zagreb	799,565	101,2
4	Graz	274,207	109,7
5	Ljubljana	272,220	99,0
6	Trieste	204,420	96,9
7	Rijeka	123,725	96,2
8	Klagenfurt	97,880	106,4
9	Maribor	95,171	84,2

* Number of inhabitants shown in rounded numbers

Source: S. Žuljić, *Bilješke o Zagrebu* (1953- 1978) (Notes on Zagreb), *Ekonomski institut Zagreb*, 1978, Census of the population, households and apartments 2011, CBS, Zagreb and the statistical bases of neighbouring European countries and towns around 2011 and 2015, www.dzs.hr; www.ec.europa.eu/eurostat/web/cities/data/database

Until World War I, Vienna was the most significant city in the area. In 1910, it had over 2 million inhabitants. Budapest was at the time a city slightly larger than today's Zagreb and it was developing as a secondary political and state centre. Trieste and Graz followed, while Zagreb had only 79,000 inhabitants and it performed mostly transport and local political functions.

With the growth of its transport and economic significance and the change of political circumstances, in the early 1970s Zagreb exceeded the number of 600,000 inhabitants and climbed to the third place from the fifth in the ranking of selected towns/cities. Zagreb still holds that rank. The capital of Austria developed much faster than Budapest over the past twenty years, especially since the expansion of the EU and the arrival of large European and international corporations as well as migrants from new members of the Union. Over a period of one hundred years (1910-2011), the number of inhabitants in Vienna decreased by around 332,000 or 16.3%, while the population of Budapest almost doubled. However, in the period from 2001-2011, the population of Vienna rose by around 164,000, and the latest estimates (2015) confirm that Vienna is now larger than Budapest and that by 2029 it might have 2 million inhabitants.

Based on the number of inhabitants in the period 1910-2011, Zagreb grew in size tenfold, and in the 1950s it grew larger than Ljubljana, Graz and Trieste, and is still growing, although somewhat slower. Other towns/cities in the regional settings had local significance throughout the relevant period.

Table 2. Relative relations in size of select towns/cities in the Danube-Mediterranean inter-space

1910, 2011 and 2015

1910			Rank reciprocity*
Rank	Towns/cities	Total number of inhabitants	
1	Vienna	2,031,000	1
2	Budapest	880,000	0,4333
3	Trieste	229,000	0,1128
4	Graz	152,000	0,0748
5	Zagreb	79,000	0,0389
6	Rijeka	50,000	0,0246
7	Ljubljana	47,000	0,0231
8	Klagenfurt	29,000	0,0143
9	Maribor	28,000	0,0138
2011			Rank reciprocity*
Rank	Towns/cities	Total number of inhabitants	
1	Budapest	1,700,000	1
2	Vienna	1,699,000	0,9994
3	Zagreb	790,017	0,4647
4	Ljubljana	275,000	0,1618
5	Graz	250,000	0,1471
6	Trieste	211,000	0,1241
7	Rijeka	128,600	0,0756
8	Maribor	113,000	0,0665
9	Klagenfurt	92,000	0,0541
2015			Rank reciprocity*
Rank	Towns/cities	Total number of inhabitants	
1	Vienna	1,797,337	1
2	Budapest	1,759,407	0,9789
3	Zagreb	799,565	0,4449
4	Graz	274,207	0,1526
5	Ljubljana	272,220	0,1515
6	Trieste	204,420	0,1137
7	Rijeka	123,725	0,0688
8	Klagenfurt	97,880	0,0545
9	Maribor	95,171	0,0530

* Rank reciprocity is the relationship of the number of inhabitants of each individual town/city based on the number of inhabitants in the largest city

Source: Table 1.

Following the fall of significance of Graz and Trieste, Zagreb becomes the third largest city in the Danube-Adriatic Sea inter-space after World War II, just after Budapest and Vienna. Its growth in significance is particularly evident from the relative indicators of movement of the total number of inhabitants in relation to the largest city in the group according to the 2011 census.

A very dynamic growth of the population of Zagreb in the period (index 10000,0), the most dynamic one when compared to other towns/cities in the group, enabled Zagreb to take third place back in the 1960s, after Budapest and Vienna. While in 1910 Zagreb was 26 times smaller than Vienna based

on the number of inhabitants and was at the periphery of the Austro-Hungarian Monarchy, and 11 times smaller than Budapest and more than three times smaller than Trieste and around two times smaller than Graz, in the early 21st century the ratios changed. In 2011, Zagreb, in its administrative-political scope (around 70 settlements, two of them urban, and the remaining ones more or less urbanised), was only 2.1 times smaller than Budapest, around 2 times smaller than Vienna, but much larger than Ljubljana, Trieste, and Graz.

Zagreb today holds an important place in the system of centres of Central Europe and Europe's south-east.

In the system of city centres of Central and Southeastern Europe in a 500km radius from Zagreb (from Prague in the north to Rome in the south, Milan in the west, and Belgrade in the east), Zagreb is a conurbation in the second size group (500,000-1,000,000 inhabitants), while the area of its urban agglomeration (2015) has around 1,100,000 inhabitants. Zagreb formed its city region, the only in Croatia, in the 1980s. It belongs to a group of around ten leading urban centres in this part of Europe.

Regarding the physical framework of the City, in terms of the demographic and transport development of Zagreb and its physical environment, it is necessary to mention several spatial terms and basic data on the state in the area used for analytical purposes, such as: Zagreb surroundings and the Zagreb region, ie, the Zagreb agglomeration.

Table 3. Basic data on the state in the Zagreb area, 2011

Area	Surface area			Population			Settlements		
	km ²	%	%	Number	%	%	Number	%	%
CITY OF ZAGREB	641,32	17.3	1.1	790,017	71.3	18.4	70	9.2	1.0
Of that: - locality of Zagreb ¹⁾	305,96	8.3	0.5	688,163	62.1	16.1	1	0.1	0.0
ZAGREB COUNTY ²⁾	3.060,00	82.7	5.4	317,606	28.7	7.4	694	90.8	10.3
Zagreb surroundings ³⁾	3.395,36	91.7	6.0	419,460	37.9	9.8	763	99.9	11.3
ZAGREB REGION ⁴⁾	3.701,32	100.0	6.5	1,107,623	100.0	25.8	764	100.0	11.3
Republic of Croatia	56.594,00	-	100.0	4,284,889	-	100.0	6,757	-	100.0

¹⁾ Relates to the urban settlement of Zagreb, which is, in urban, municipal and legal sense, a single settlement for which the statistics service publishes collection data. This settlement is divided into 15 city neighbourhoods, units of local self-government, which also have urban character. In terms of the area covered by the settlement, Zagreb accounts for around 306 km² and the Zagreb area of the Medvednica Park of Nature accounts for 94.9 km².

²⁾ The spatial "ring", the spatial surrounding area around the City of Zagreb.

³⁾ The term surroundings is understood differently, depending on the area to which it refers. It mostly means suburban settlements that are demographically and functionally connected with the city. In this paper, the surroundings of Zagreb or the Zagreb surroundings include all suburban settlements around the city itself, ie, other settlements of the City of Zagreb and the settlements of the Zagreb County.

⁴⁾ The spatial scope of the Zagreb region means, in this paper, the totality of the administrative and political area of the City of Zagreb and the Zagreb County, and is used for the purpose of analytical demarcation.

Source: Statistical Yearbook of the Republic of Croatia for 2014, Table 2.2 (Territorial organisation as on 31 December 2013), Croatian Bureau of Statistics, Zagreb, 2015; surface areas – record of physical units of the Croatian Geodesic Administration 2015.

In this paper, the Zagreb region includes the administrative and political area of Zagreb or the City of Zagreb, within which, based on the type and character of the settlement, the central and largest settlement, Zagreb, stands out in relation to other suburban settlements in the scope of the City, but there are other numerous more or less urbanised and rural settlements in the scope of its wider surrounding area entitled County of Zagreb. In view of significant differences in the size and type of settlement, demographic development, especially the degree of urbanisation and mobility of the population, this paper includes the basic physical and demographic data in the city area of Zagreb in relation to its surrounding area.

The term used in this paper includes another conditionally demarcated space in the Zagreb area entitled urban agglomeration Zagreb. The limits of the urban agglomeration Zagreb, as of 2015, further to legal and methodological provisions and criteria for the demarcation of urban settlements in the Republic of Croatia, are defined in a way to include the area of the City of Zagreb as the seat of the urban agglomeration and the surrounding unit of local self-government based on the basic criteria for their inclusion in the urban settlement, such as: the share of commuters arriving at the centre of the urban area, accounting for at least 30% of the total labour force in the unit of local self-government/departure points of commuters and physical integrity of the area. This criterion also includes other additional criteria, relating to infrastructural connections, economic and other connections through current or planned joint development projects of the city and its suburban and wider surroundings.

Urban agglomerations are defined as socio-economic city regions that include, along with the central city, that part of its surroundings that, under the influence of the function of work of the central city, experienced a certain degree of its own socio-economic transformation. In singling out the physical surroundings around the central city, that is why we apply certain criteria of functional connections and other characteristics of transformation of units of local self-government, ie, its settlements.⁶ According to such criteria, applied in the latest research, the Zagreb city region (S. Klempić-Bogadi) consists of the city with its uninterrupted space of the surrounding 346 settlements, nine of which are urban settlements, 211 widely urbanised, 92 poorly urbanised, and 34 rural settlements (Figure 3). In the urban settlements of the region, according to the 2011 census, there were 999 247 inhabitants, 69.1% of which in the city and 309 000, or 30.9%, in the surrounding area. The Zagreb region, thus, covered to a lesser or greater extent five counties (Counties of the City of Zagreb, Zagreb, Krapinsko-Zagorska, Sisačko-Moslavačka, and Varaždinska). More precisely, at the beginning of the 21st century, the surroundings, under the mentioned criteria, in addition to the 69 settlements in the administrative and territorial scope of the City, included 277 settlements in 25 municipalities or towns in the said four counties.

⁶ Apart from the differentiation of city and rural settlements, well-known Croatian researchers of city regions (Vresk, M., Žuljić S., Klempić-Bogadi S. and others) differentiate between strongly or poorly urbanised settlements. The following variables were used for strongly urbanised settlements in the latest research for determining city regions (Figure 3): less than 6% engaged in agriculture and 75% and more of the population engaged in the labour force. Poorly urbanised settlements had more than 6% of the population engaged in agriculture and more than 50% engaged in the labour force. Rural settlements are those that do not meet the said criteria. This division is the basis for evaluating the degree of socio-economic changes in the surroundings of large towns in Croatia (*Migracije i regionalni razvoj Hrvatske*, The Institute for Migration and Ethnic Studies, Zagreb, 2010, pp. 31-32).

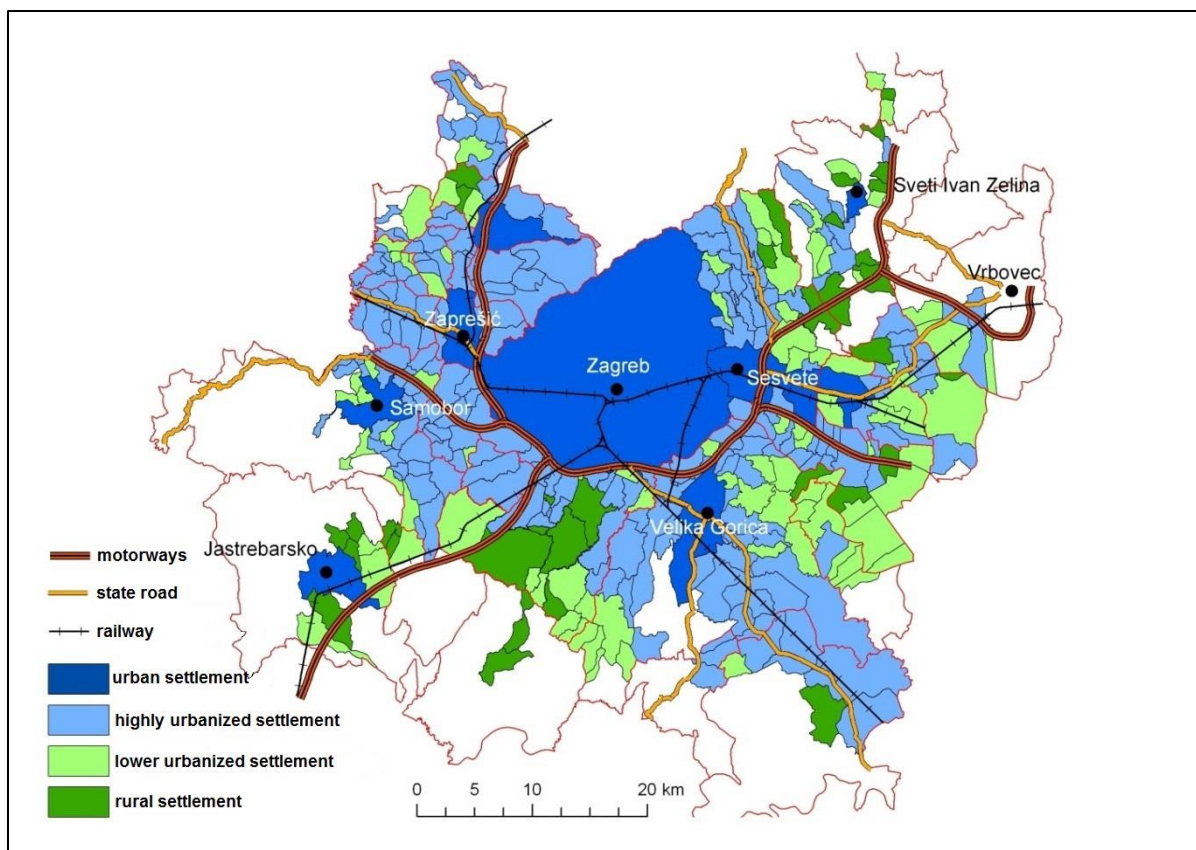


Figure 4. Roads and the level of urbanisation of the city region Zagreb, 2001

It is visible from the appearance of the physical scope of the Zagreb region that the most intensive urbanisation is in the immediate vicinity of Zagreb and in the area surrounding the satellite towns in the Zagreb surroundings (Sesvete, Dugo Selo, Velika Gorica, Samobor, Zaprešić, Jastrebarsko, Sveti Ivan Zelina and Vrbovec), which are obviously positioned along the most significant roads (motorways, state roads, and railways) in this area. It should be stated that the limits of city regions, including the one of Zagreb, are not fixed, but that they change in time and space in line with changes in socio-economic and general development, including demographic development.

Further to the latest Act on Regional Development in Croatia⁷, the field of urban agglomerations corresponds to the functional area it includes:

- the administrative territory of the largest unit of local self-government (city – which is at the same time the seat of the urban agglomeration);
- the administrative territories of the surrounding units of local self-government with robust functional and economic connections to the city that is the seat of agglomeration.

The new regional policy in Croatia pays special attention to the development of urban agglomerations of Zagreb, Split, Rijeka, and Osijek.

The new Act on Regional Development stipulates the following basic criteria for defining the scope of the surrounding units of local self-government that are part of the urban agglomerations around four large towns in Croatia, including the Zagreb urban agglomeration, viz.:

- The share of commuters who travel to the centre of the urban agglomeration of at least 30%;

⁷ OG 147/14, Article 14.3.

- Physical continuity of the urban agglomeration, and
- Additional criteria (developmental aspects).

Therefore, on the basis of the above criteria stipulated for the scope of urban areas, the area of the urban agglomeration Zagreb, for the purposes of drawing up the Strategy for the Development of the Urban Agglomeration Zagreb until 2020, includes the total area of the City of Zagreb and the area of 31 units of local self-government (towns and municipalities) in the surrounding area. The area of the scope of the urban agglomeration Zagreb as defined includes 1 094 184 inhabitants, which accounts for one-fourth (25.5%) of the total population of Croatia. The density in this area is very different: from the City of Zagreb, which, in its largest city settlement, has the densest population in the agglomeration and the state itself of around 2250 inhabitants/km², the County of Zagreb (an area that is included in the agglomeration) with the density of 130.3 inhabitants/km², to the scope of the County of Krapinsko-Zagorska with the density of 132.6 inhabitants/km², while in the area of the two municipalities in the periphery (Lekenik and Lasinja), the density is much lower.



Figure 5. The physical scope of the urban agglomeration Zagreb on the basis of the basic criterion of commuters – employees and additional - developmental criteria

3. The significance and special features of Zagreb as the centre of the state and of the region

Zagreb was already called Croatia's metropolis in the 19th century, which means the centre of all Croatian countries at the time. Only after more than a hundred years (1990) did Zagreb become the capital of the independent Croatian state. Its international role has been growing ever since.

Zagreb is today a political, administrative, economic, educational, scientific and cultural centre of Croatia, its capital, and a central European and national centre of development.

The administrative and political area of the city (City of Zagreb) accounts for only 1.13% of the state land territory, and according to the 2011 census, 18.5% of the population lived within its area, while the total Zagreb region, ie, city agglomeration accounts for around 6% of the state territory and around one-quarter of the state population.

The City of Zagreb generates around one-third of the national gross domestic product and the County of Zagreb 5.6%, while in the wider surrounding area this share is much lower. According to data for 2012, BDP/per capita in Zagreb is higher by around 80% in relation to Croatia, while in the County of Zagreb it is lower than the state average.

In Zagreb, there is one-third of active business operators (33.3%), then around 400 000 employees (30.5%), which means that the number of inhabitants per employee is 1.9. In the area of the Zagreb region, there were around 500 000 employees or 35.5% of the total number of employees in Croatia in 2015.

In the area of the Zagreb region, especially in Zagreb, the intellectual capital accounts for the largest share. According to the 2011 census, 81.5% of the population was educated, while the state average is 69.1%. The difference in the share of persons with higher education, along with those who have a master's or doctor's degree, is particularly significant: 21.8% in the population of Zagreb. That means that Zagreb had 186 persons with higher education on 1000 inhabitants, while at the level of Croatia there was only 105.5 persons with higher education on 1000 inhabitants.

Zagreb and the Zagreb region are a transport, commercial, trading, banking, administrative and political, educational and, increasingly, tourist centre. Municipal, medical, social and administrative state and service activities are a special feature of the City of Zagreb. It has a large concentration of social infrastructure and the content, quantity, and quality of public service activities, including embassies, international organisations, and associations, is continuously growing.

Considering that the City of Zagreb has many activities, it can be referred to as a multi-functional city, while certain areas in its surroundings are mostly directed at individual activities.

In the area of Zagreb and the Zagreb region, there is a relatively high degree of automobile presence (around 400 automobiles on 1000 inhabitants), so traffic jams do pose a special problem, especially in central city neighbourhoods. There is over a million overnight stays of tourists in the area, two-thirds in the area of Zagreb.

Internal and external factors affect such functional development of Zagreb, resulting in a high accumulation of functions and growth in the degree of urbanisation.⁸ Internal stimuli of the development of Zagreb have reached a material and cultural potential and the most significant external factor is still the transformation of Zagreb from a former macro regional centre into a national metropolis and state centre, which on its part causes the development of a series of new functions.

In view of the importance of Zagreb in the urban network of Croatia, ie, in the system of central settlements and development centres, Zagreb is the largest city centre-capital, central European and state development centre. Its size and overall significance supports the network of other three macroregional or large development centres, urban agglomerations: Split, Rijeka and Osijek, as well as other larger regional, smaller regional and lower ranking centres, especially those in the region of Continental Croatia, with the most intensive expansion of its agglomeration effects to the field of the Zagreb region.

The favourable spatial relationship results in favourable distances that mostly do not exceed 400 km between Zagreb and the most distant town in the state, as calculated by the shortest main roads. With the construction and modernisation of roads, the transport distance has also dropped lately. It takes one hour and 51 minutes to reach Rijeka (the main maritime port) via the new Zagreb-Rijeka motorway and two hours and 55 minutes to reach Zadar.⁹

Apart from the favourable spatial position in the European and national urban system, Zagreb and the towns and municipalities in its agglomeration use the amenities of the transport system that developed within a wider macro region – Continental Croatia, which is connected to centres at a distance of up to 100 km. A number of city centres was formed in this area and their development depends on the development of Zagreb. Along with smaller and medium-sized centres in the County of Zagreb, other centres in the wider regional surroundings (Karlovac, Sisak, Bjelovar, Čakovec, Varaždin, Koprivnica, Krapina), the circle of towns around Zagreb, which are an important support of the urban structure within the Croatian urban network, comes second. These towns are also to a certain extent functionally connected with Zagreb and they develop under the influence of its functions. Apart from its special geotransport position, Zagreb has a special position in terms of space and systems of the state, because most internal transport flows are directed towards it, both direct and transit. The integrating role of Zagreb in connecting Croatia follows from that. Zagreb and the Zagreb metropolitan area is a concentration point for inter-regional roads and a refraction point of various transport flows.

In order to examine the significance and the attractive force of Zagreb in the state, apart from the fact that it is the largest state urban agglomeration and an intersection in the Croatian territory, developmental possibilities arising from, inter alia, its demographic size are also important. The City of Zagreb, its size, multifunctional, economic, scientific, educational, and overall significance, is

⁸ The degree of urbanisation in the area of the City of Zagreb in 2011 (measured by the share of population in city settlements against the total population) was 93.9%, in the surrounding Zagreb area only around 32%, and in the area of the Zagreb region 76.2% in relation to the state average (which was 54.2%).

⁹ The nearest border crossing with Slovenia, Bregana, is only 20 minutes away by motorway, with Serbia it is three hours and two minutes, and with Hungary, one hour and 19 minutes.

actually the precursor of positive developmental changes in the state as a whole. This paper wishes to emphasise the importance of Zagreb in the total network of Croatian towns.

The hierarchical characteristics of urban systems with special emphasis on the largest city are mostly analysed in two ways:

- the rank-size rule, and
- the urban primacy index.

A thesis arises that there is a causal-consequential connection between the size of city centres and their functional significance. The hierarchical significance of towns in Croatia is established by an analysis of the rank-size (via the urban rank-size model). The rank-size of a town is obtained by comparing the number of inhabitants in the largest town and the ordinal number of the towns ranked by size.

The urban primacy index shows the relationship between the largest and the second largest city or the relationship between the largest city and the three towns that follow. This rule responds to the question whether Zagreb is, demographically, a particularly large city in comparison to other Croatian towns and the extent of discordance between Zagreb as a macro regional centre and lower-ranking centres in the narrower and wider region, using the data from the 2011 census.

Urban primacy is defined as the relationship between the largest and second largest city and the relationship between the largest and the three towns that follow in size. Further to the law of urban primacy, the relationship between the largest city and the one that follows in size should be two. An analysis of the urban primacy index shows trends in the development of urban systems.⁹¹⁰

The example of the City of Zagreb in comparison to the second largest and three largest towns shows that the urban primacy index deviates significantly from the theoretical value. This method shows that the City of Zagreb, on the basis of the territorial division in 1981 and 1991, had significant size in comparison to other Croatian towns. However, according to the narrow scope in 2001, its urban primacy has dropped somewhat, but is still twice the amount of theoretical values.

In 2011, the urban primacy of Zagreb in relation to the second largest Croatian town – Split, is once again 4.4. This means that, based on this theoretical model, the towns in Croatia in relation to Zagreb should have more inhabitants, primarily Split, Rijeka, and Osijek, but also smaller towns with less than 100 000 inhabitants. The rank-size would then be more regular, and the urban system of the Croatian state more evenly developed.

By comparing the relationship of the number of inhabitants of Zagreb and Split, Zagreb and the total population of the three towns that follow in size, and Zagreb and the total population of the ten Croatian towns that follow in size, one can see the movement of Zagreb's urban primacy index.

Table 4. The urban primacy index of Zagreb in the period 1980-2011:

Area	1981	1991	2001	2011
Zagreb in relation	4.45	4.66	4.13	4.43

¹⁰ Vresk M.; *Grad u regionalnom i urbanom planiranju*, Školska knjiga, Zagreb, 1990, p. 115.

to Split				
Zagreb in relation to the three towns that follow	1.77	1.87	1.74	1.90
Zagreb in relation to the ten largest towns that follow in size	0.99	0.99	0.95	0.96

Source: Data from the census for the period 1981-2011; as calculated by the author.

According to the 2011 census, Croatia had 128 towns, in what is a legal definition of the word, and 3 028 042 people who lived in them. Using the settlement differentiation model (Croatian Bureau of Statistics, 2011), there are 143 urban settlements with 2 324 144 inhabitants or 54.2% of the total population of the state, while rural and transitional settlements (around 6613 of them) accounted for 45.8% of the population of Croatia. According to the legal criterion for differentiating between urban settlements, it follows that the share of the urban population of Croatia in the total population rose from 43.7% (1971) to 54.2% in 2011. Therefore, the non-urban settlements in Croatia record a decrease of their share (from 56.3% to 45.8%). However, the rate of growth of urban population is still less than in other countries in the surrounding area, primarily in those that have recently joined the EU.

According to the latest census, only 29 towns had more than 20 000 inhabitants in Croatia, and the population in those towns was 2 154 678 in number or 50.3% in the total number of inhabitants. This shows that the type of distribution of towns by rank-size is still largely asymmetrical. The dominant position of Zagreb is shown, which is followed by the regional centres of Split, Rijeka, and Osijek, especially if we compare those with towns in the same region. The total distribution (Table 5) deviates from the theoretical distribution in several places. The first interruption is evident between Zagreb and the second largest town (Split), the second between the fourth and the fifth, and there are almost no interruptions between other towns. This shows that the model of urbanisation that started in the past, in this part of Europe, in which Croatia like many other small countries primarily worked on developing its capital, while other towns lagged behind. The second group of towns (Split, Rijeka, Osijek) had for a long time and still have the same position and the same functions, and they are regional centres.

If the above rule is applied to statistical and formerly traditional, smaller regions in Croatia, an identical picture is obtained as at the level of Croatia as a whole, i.e., in the distribution of towns by size there is an almost regular row, except in the Zagreb and central European macro-region, in which the size of Zagreb makes the regional distribution of towns significantly asymmetrical.

Table 5. Croatian towns in the order of rank-size, 2011

Towns	Number of inhabitants	Position	Actual rank-size	Zagreb	Split	Rijeka	Osijek
ZAGREB	790,017	1	1	1			
Split	178,102	2	4.43		1		
Rijeka	128,624	3	6.14			1	
Osijek	108,048	4	7.31				1

Zadar	75,062	5	10.52		2.37		
Velika Gorica	63,517	6	12.44	12.44			
Slavonski Brod	59,141	7	13.36				1.83
Pula	57,460	8	13.75			2.24	
Karlovac	55,705	9	14.18	14.18			
Sisak	47,768	10	16.54	16.54			
Varaždin	46,946	11	16.83	16.83			
Šibenik	46,332	12	17.05		3.84		
Dubrovnik	42,615	13	18.54		4.18		
Bjelovar	40,276	14	19.62	19.62			
Kaštela	38,667	15	20.43		4.60		
Samobor	37,633	16	20.97	20.97			
Vinkovci	35,312	17	22.37				3.06
Koprivnica	30,854	18	25.60	25.60			
Đakovo	27,745	19	28.47				3.89
Vukovar	27,683	20	28.54				3.90
Čakovec	27,104	21	29.15	29.15			
Požega	26,248	22	30.10				4.11
Zaprešić	25,223	23	31.32	31.32			
Sinj	24,826	24	31.82		7.17		
Petrinja	24,671	25	32.02	32.02			
Solin	23,926	26	33.02		7.44		
Kutina	22,760	27	34.71	34.71			
Virovitica	21,291	28	37.10				5.07
Križevci	21,122	29	37.40	37.40			
Sv. Nedelja	18,059	30	43.75				

Source: Population in the largest towns and municipalities, Census 2011, Croatian Bureau of Statistics, Zagreb; as calculated by the author.

From an analysis of the above data on the number of inhabitants in the Zagreb area, it follows that, based on the 2011 census, Velika Gorica as the second largest town in the area concerned, was 12.27 times smaller than Zagreb, that Zagreb was larger than Samobor 20.9 times, and from Zaprešić 32.3 times. However, it is positive that in the area of the Zagreb region smaller and medium sized towns are positioned radially around Zagreb, as opposed to the urban network in the coastal area of Croatia, which could not follow the same pattern in view of their geographical characteristics.

One could say that the type of distribution of towns in Croatia by the order of rank-size has the significance of a transitional phase characterised by the pronounced dominance of the capital and a relatively weak representation of medium-sized towns. The state of the urban network in the urban region of Zagreb and in the wider area of central Croatia, to which the Zagreb area is adjoined, is somewhat better. This area, thanks to Zagreb and the satellite towns in its surroundings, has a long urban tradition.

In the Croatian network of towns, the largest problem is that towns as the main drivers of development are not equally distributed, so the span of one town is 460 km² of state territory. In the Zagreb region, the situation is slightly better as one town accounts for 370 km².

An appraisal of the size of the City of Zagreb in relation to other Croatian towns can be shown by comparing the results of the rank-size of capitals in some other European countries. In relation to some European capitals, the size of Zagreb is not that pronounced. For example, in 2011, Vienna was larger than the second largest town 6.4 times, and its size in comparison to the three towns that follow it was 2.64 times larger. The first coefficient for the City of Budapest was 7.58 and the second one was 3.9; for Zurich the first coefficient is 2.60, and the second one 1.0. In comparison to these examples, Zagreb is somewhere between Zürich on one side and Budapest and Vienna on the other.

This means that Zagreb, conditionally speaking, does not have an excessive concentration of the population in the state in comparison to the capitals of Hungary, Austria, and other European countries. However, that also shows that it does not have a concentration that would be appropriate for the polycentric structure, which is the case with the capital of Switzerland and some other European towns. The capitals of the Czech Republic and Slovakia have a relatively low urban primacy index. The first coefficient for Prague is 3.10, and for Bratislava 1.87.

Table 6. Zagreb in the group of towns by size in Croatia, 2011

Sizes of towns	Number of towns in the group	Number of inhabitants in the group	Share	
			of towns	of inhabitants
Total*	127	3,016,137	100.0	100.0
under 5 000 inhabitants	18	59,681	14.17	1.98
5 001 – 10 000	42	296,726	33.07	9.84
10 001 – 20 000	38	505,052	29.92	16.74
20 001 – 200 000	28	1,364,661	22.05	45.24
200 001 inhabitants and more = City of Zagreb	1	790,017	0.79	26.19

* In 2013, Popovača was also declared a town, so that since then Croatia has a total of 128 towns.

Source: Statistical Yearbook of Croatia, 2011

This means that the population of the City of Zagreb accounts for more than one quarter of the total population of all towns in Croatia (26.2%), and in the group of towns according to the UN methodology¹¹, it accounts for more than one third.

It is a fact that such urban primacy based on the demographic criterion favours the development of Zagreb, especially in the circumstances where it is necessary to build a new central European state centre and capital.

However, an analysis of the indicators of urban primacy does not take into account the qualitative elements important for the relationship of certain states and their capitals. One should bear in mind that Zagreb and its labour resources, scientific, cultural and other communal, commercial, and social infrastructure affect the economic and social power of Croatia, and of the Zagreb macro-region, and the macro-region of Continental Croatia. The indicators of its urban primacy have surely encouraged and still encourage its further functional hierarchy in relation to other towns in the region and Croatia.

¹¹ Among towns with more than 20 000 inhabitants.

Modern processes in the development of the economy and society rest for the most part on the power and development of individual towns. Towns reflect the economic balance and contribute to the competitive advantages of their regions. "It is very indicative that the economic direction is different in small, medium, and large towns. Small towns are largely directed at the industry, and small ones at services."¹² It is a characteristic of small towns in Croatia, and in the Zagreb urban region, that they are mostly mono-functional, while Zagreb, as most large towns, is multifunctional. In the Zagreb region, the functional orientation of the surroundings towards the capital is pronounced, primarily in view of the employment of a significant share of its labour force in the city.

Zagreb's policies and development management, as well as the measures of state policy, should influence the establishment of a functional, economic, and total balance in the region. Considering that in Croatia, and in the Zagreb region, there is a lack of medium-sized towns, the developmental influence should be directed not only towards the urban agglomerations but also to other larger and smaller urban areas.

The special position of the City of Zagreb within Croatia is reflected in that Zagreb, according to the Act on the City of Zagreb, is a special and unique territorial and administrative self-governing unit, which holds the position of a county. In the territorial sense, it is not divided into the units of local self-government (municipalities and towns) as other counties are, but its local self-government is based on the division of the City into 17 city neighbourhoods, and it functions as a single urban unit through its communal, urban, transport, social and total city infrastructure.

4. Movement of the total number of inhabitants of the Zagreb region in the period from 1857 to 2011

A reliable retrospection of the population in this area is enabled on the basis of data from the 16 censuses held to date in the period from 1857 to 2011, therefore, over a period of 154 years, and which show long-term growth in the number of inhabitants of Zagreb, but also almost continuously of the County of Zagreb as well.

The total population in the area grew, in the period 1857-2011, by slightly more than six times: from 183 020 to 1 107 623 according to the results of the official statistics. Chain indices show that the greatest growth was in the censuses of 1931, 1948, and 1971, and the tempo of growth drops substantially in the last period between the censuses, primarily because of reductions in the area of the City of Zagreb.

The 2011 census shows growth in the number of inhabitants in the total area by 1.7% in relation to 2001, where the City of Zagreb grew by 1.4%, and the County of Zagreb more dynamically by 2.6%, and it is one of Croatian counties with the most dynamic demographic growth.

Table 7. Movement of the number of inhabitants in the Zagreb region according to the censuses from 1857 to 2011

¹² Šimunović I., Filipić P.: Regionalna ravnoteža u prostoru Hrvatske, ZIRUS, d.o.o., Split, 1995.

Censuses	Number of inhabitants in the Zagreb area	Indices of movements of the population in the region		Annual average rate of growth in the period between censuses	Population density inhabitants / km ² 2011*
		base 1857.= 100	chain		
1857	183,020	100.0	-	-	49.5
1869	201,353	110.0	110.0	0.96	54.4
1880	222,512	121.6	110.5	1.01	60.1
1890	261,786	143.0	117.7	1.64	70.7
1900	306,208	167.3	117.0	1.58	82.7
1910	347,501	189.9	113.5	1.28	93.9
1921	375,906	205.4	108.2	0.79	101.6
1931	482,119	263.4	128.3	2.52	130.3
1948	584,067	319.1	121.2	1.95	157.8
1953	627,330	342.8	107.4	0.74	169.5
1961	711,951	389.0	113.5	1.28	192.4
1971	862,732	471.4	121.2	1.95	233.1
1981	982,494	536.8	113.9	1.31	265.5
1991	1,060,815	579.6	108.0	0.77	286.6
2001**	1,088,841	594.9	102.6	0.25	294.2
2011	1,107,623	605.2	101.7	0.20	299.2

* The surface area in km² in 2011: 3703 km² in total, where the City of Zagreb accounts for 641 km² and the County of Zagreb 3061.7 km². [Data of the State Geodesic Administration, as of 2015].

** according to the de facto concept

Sources: The Statistical Yearbook of the Republic of Croatia 2003, Table 2-2. Counties, surface area, population, towns, municipalities and settlements (territorial organisation as of 31 December 2002), Croatian Bureau of Statistics, Zagreb, December 2003, Settlements and the population of the Republic of Croatia 1857-2001, CBS, Zagreb 2005;

Census of the population, households, and apartments 2011, The Statistical Yearbook 2014.

Regarding the structure of the population in the two counties in the long-term period, it is evident that the share of the City of Zagreb increased drastically from 26.4% in 1857 to 71.3% in 2011. However, the share of the population of the County of Zagreb was subject to a reverse process almost simultaneously, a decrease in the share from 73.4 to 28.7%, if we observe it over such a long historical period of over 150 years.

The average annual rate of growth in certain inter-census periods moved in a very differentiated manner, being the lowest in the periods of war, reaching the maximum of 2.52% according to the 1931 census, and 1.95% in 1971, with a drop to 0.20% according to the 2011 census. Population density in the area increased substantially from the mid 19th century from 49.5 inhabitants per km², to exceed one hundred inhabitants in 1921, which the Croatian average has not reached even in 2017. Population density as of 1948 to the beginning of the 21st century moved very dynamically. Data from the 2011 census confirmed the indicator of around 300 inhabitants/km², although, with large differences between Zagreb and certain inferior spatial units in the surroundings.

We should single out the movement of the total number of inhabitants in the same period in the area of the City of Zagreb.

Zagreb, at the time of the first official census in 1857, had only cca 16 000 inhabitants in the then physical scope, where one-quarter were foreigners. It extended over the area of 33.3 km².

In the late 19th century, the city grew to around 40 000 inhabitants but it did not expand territorially until 1900 when it almost doubled (64.37 km²). Development of transport and industry resulted in its modern development, as mentioned earlier, accompanied by the major influx of people from other Croatian areas, especially from the overcrowded surroundings.

Table 8 shows the process of expansion of the city and the dynamics of growth in population from one census to the next both in the area of the central city settlement Zagreb in its present limits and within the area of the administrative city in its today's scope (70 settlements) as well as in the physical scope as it existed at the time of each individual census.



Figure 6. Zagreb area map : City of Zagreb and County of Zagreb, 2017.

Table 8. Variation in the number of inhabitants of Zagreb based on censuses in the period from 1857 to 2011, based on the official results of the census

Variants: A –City of Zagreb, calculated with the territory of the city at the time as treated by each individual census

B – City of Zagreb, retrospection of the territorial scope of the city from 2011 (70 settlements)

C – the settlement Zagreb within its limits 2011

Total number of inhabitants								
	A				B		C	
Census year	Number within the limits at the time of the census	Year of doubling	Index 1857=100	Surface area in km ²	Number within the limits 2011	Index 1857=100	Settlement Zagreb scope 2011	Index 1857=100
1857	16,657		100.0	33.3	48.266	100,0	32.203	100.0
1869	19,857		119.2	33.3	54.761	113,5	37.001	114.8
1880	30,830	1883	185.1	33.3	67.188	139,2	48.136	130.0
1890	40,268		214.7	33.3	82.848	171,6	60.910	126.5
#1900	61,002	1903	366.2	64.4	111.565	231,1	87.239	272.8
1910	79,038		474.5	64.4	136.351	282,5	109.029	338.6
1921	108,674		652.4	64.4	167.765	347,6	140.815	437.2
1931	185,589	1924	1.114.10	64.4	258.024	534,6	227.838	707.5
#1948	279,623	1946	1.678.70	74.9	356.529	738,7	325.223	1 009.9
#1953	350,829		2.106.20	235.7	393.919	816,1	361.564	1 122.8
#1961	430,802	1967	2.586.30	495.6	478.076	990,5	442.768	1 328.0
1971	602,205		3.615.30	497.9	629.896	1 305,0	579.943	1 800.9
#1981	768,700		4.614.80	1.261.54	723.065	1 498,1	656.380	2 038.2
#1991	933,914		5.606.70	1.715.55	777.826	1 611,5	706.770	2 194.7
#2001	784,166		4.707.70	641.55	784.166	1 624,7	691.724	2 148.0
2011.	790,017		4742.00	641.3	790.017	1636,8	688.163	2137.0

*According to the concept of permanent population

** Years of doubling are calculated from the mean values of the variations in the number of inhabitants between the two censuses.

The censuses preceded by administrative and territorial changes.

Sources: - Korenčić, M., Naselja and the population of Croatia 1857-1971, JAZU, Book 54, Zagreb, 1979, pp. 765-780.

Settlements and the population of the Republic of Croatia 1857-2001, DZS, Zagreb, 2005.

Census of the population, households, apartments and agricultural holdings 1991, The population in the country and abroad by settlement, Documentation 911, CBS, Zagreb, 1996.

The Statistical Yearbooks of Croatia 1982 and 1997.

Census of the population, households, and apartments, 31 March 2001, Population by presence/absence in the settlement of the census, CBS, Zagreb, 2002, and Census of the population, households, and apartments 2011, The Statistical Yearbook 2014.

The process of expansion of the city has not stopped to this day, regardless of its spatial decrease as the result of the latest administrative and territorial changes in 1997, when most of the immigrants begin to settle in the surrounding area.

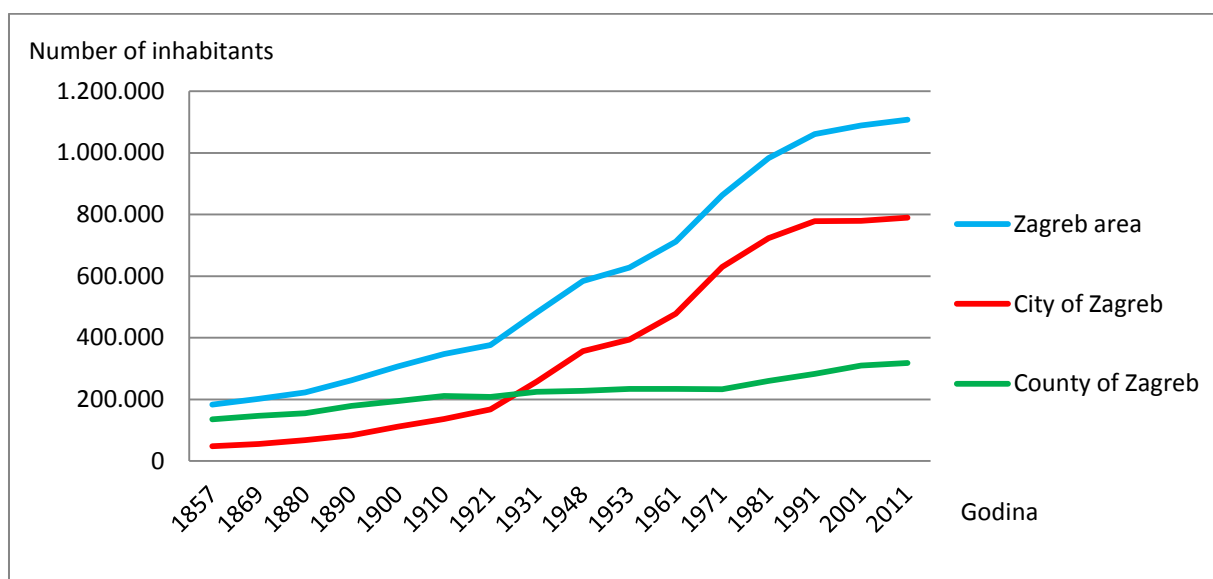


Figure 7 . Movement in the total number of inhabitants of Zagreb and its surrounding area in the period 1857-2011

In the early 20th century, especially after 1931, Zagreb's accelerated demographic development in relation to other town localities in Croatia and the territory of the former Yugoslavia begins, primarily because of the transport valorisation of the position and industrial development. Its economic dominance after World War II is followed by intensive demographic development, supported by influx from other areas of Croatia and other republics of the former Yugoslavia, primarily from Bosnia and Herzegovina. In the second half of the 20th century, the city leaves the group of regional centres and is transformed into one of the largest urban centres of the former state.

Following the concentration of the first one hundred thousand inhabitants in today's city area at the beginning of the 20th century, demographic growth of Zagreb until 1921 was not a special communal and urban problem. In the period from 1921 to 1931, the number of inhabitants of Zagreb grows annually at an unprecedented rate of 4.3, ie, in the then limits at the rate of 5.5%.

The following conclusions arise from the above data and detailed demographic research of the movement of the population in the Zagreb area and of the connection between the demographic development of the city and its surrounding area:

- In terms of demographics, the Zagreb area developed continuously over the long historical period discussed here as the result of a causal-consequential connection with the favourable geotransport position, development of roads, economic, and general social development.
- The total number of inhabitants of the City of Zagreb, according to the retrospection of the territorial scope in 2011, increased around 16 times in the period from 1857 to 2011, of the

central urban settlement Zagreb around 20 times, the County of Zagreb 2.4 times, and of the Zagreb area around six times, from 183 020 to 1 107 623 inhabitants, although with different intensity in the inter-census periods.

- The average annual rate of growth of the population of the City of Zagreb in the period 1971-2011 was 0.71, and the average rate of the settlement of Zagreb was 0.6 with a tendency of decrease in the last inter-census interval as well as after 2011 until today. It is evident that in this period the Zagreb area gradually assumed the function of demographic growth of Zagreb.
- As the result of long-term demographic and general development tendencies, the layout of the population in the Zagreb area based on the latest census confirms the relationship of the population of the City of Zagreb towards the County of Zagreb in the ratio of 71.3:28.7, and of Zagreb towards the surrounding area in the ratio of 62.1:37.9. Therefore, the population is still concentrated mostly in the area of the settlement of Zagreb, although the layout trend is gradually improving.
- The areas of the satellite towns of Sesvete, Dugo Selo, Samobor, Sveta Nedjelja, Zaprešić, and Vrbovec record a continued growth, while other towns in the Zagreb region in this period grew based on different dynamics. A large number of municipalities in the Zagreb surroundings in the last inter-census period experienced depopulation, while only ten still record a growth in the number of inhabitants.
- The central city settlements in the surroundings, along with Zagreb, are the axis of development of the area and of the establishment of a demographic and regional balance.
- Zagreb holds a central development significance and there is exceptional dynamics between Zagreb and the surrounding area concerning the mobility of the population and economic activities, although one should bear in mind that Zagreb, in view of its significance, does not have only demographically and socially and economically open relationship towards its surroundings, but also towards the wider macro-region of Continental, and even Croatia as a whole.
- Population density in the area ranges from the biggest density in the area of the settlement Zagreb, where in 2011 there were 2249.2 inhabitants/km², to the smallest in the periphery where it was, on average, 49.5 inhabitants/km² of state average. This last one is evidence that the periphery in the researched area, after the earlier “vacuuming” of the population by Zagreb and emigration through outside migration flows, has never managed to recover demographically. The settlement Zagreb has population density that is around 30 times bigger than the state average, and the Zagreb area only around 3.9 times. The range of population density in this city region ranges, therefore, from central overcrowdedness to almost empty settlements, or some of them, in the peripheral municipalities (Žumberak, Bedenice, Krašić).

- Regarding the spatial distribution of the population, density in the area of the Zagreb region is still marked by a relatively high polarisation, especially in the relationship between Zagreb and the surrounding area. Ever since World War II until 1971, Zagreb influenced the processes of demographic polarisation in this area by “vacuuming” the surrounding population. The main positive effect of such development was intensive demographic development of the home town, its satellites, reduced pressure on limited agricultural areas in the surrounding area with employment in non-agricultural activities in the city, increased level of urbanisation in the surrounding settlements and increased population mobility. However, the negative effects were as follows: the population leaving the peripheral settlements in the surroundings and their general lagging behind in development, and on the other hand accumulation of problems in the city as the result of population concentration. Mutual intertwining of the *process of polarisation* in the previous period (demographic and others) and the *process of expansion* in the period 1971-2011 in the demographic development of the area resulted in substantial changes in the direction of more uniform spatial distribution of the population.
- Daily migrations of employees and other groups of the population in this area are a significant indicator of demographic, economic, social, and transport connectedness and the process of suburbanisation of the surrounding area under the influence of Zagreb. According to the 2011 census, there are 113 000 daily migrants – employees to the City of Zagreb; their share in the total number of employees is 29.8%. There are 87 000 daily migrants – employees from the very area of the urban agglomeration Zagreb, and from the area of the wider Zagreb surroundings 100 000 daily migrants – employees, who account for one-quarter of jobs in the city. These relative indicators confirm the extent to which the City of Zagreb is a place of work for the neighbouring population in this urban area, but also wider metropolitan area.

Although in the last two inter-census periods there is an evident decrease in the population in the narrow area of the City of Zagreb and the slowing down of growth of its surroundings, in the observed long-term period the population of the area grew indisputably, in comparison to the average of Croatia and most other counties. From a demographic position, the reason would be the strongest influence of immigration on the growth of the population of Zagreb in Croatia.

A question arises: What are the main reasons that Zagreb, in the period from the second half of the 19th century to the beginning of the 21st century, experienced such demographic growth in spurts?

Although in this century there were several historical-political and social-economic changes in Croatia that influenced the development of Zagreb and its city regions, ie, urban agglomerations into its contemporary size and significance, the commencement of its more dynamic demographic and the resulting economic development is, to a great extent, connected to the development of transport and roads from the late 19th century to this day, and its overall geostrategic position.

Very dynamic and still positive, although decelerated, demographic growth provides for a good explanation of the directions and processes of intertwining in the development of its network of

settlements, the dynamics and level of its urbanisation with the expansion and construction of roads, and more favourable general geostrategic position.

Apart from the favourable transport-geographic position, the entire area of the Zagreb agglomeration with Zagreb as its central urban location is a significant Croatian economic and starting administrative and political location, attractive to foreign investors. In terms of the international transport connections, Zagreb and its region, as a whole, especially Continental Croatia (NUTS 2), are well integrated into the European road transport system as because their vicinity and motorways they are connected with the motorways of the neighbouring countries, and Europe as a whole.

One should say that the transport overburdening of Croatian motorways and rails is still relatively modest, primarily as the result of diminished Croatian production and in view of the insufficient level of the achieved economic growth, which naturally, eventually, decelerates the related demographic growth, and strengthens the negative balance of its external migration.

5. Conclusion

The hypothesis we presented at the beginning of this paper concerning the connectedness of the demographic growth of Zagreb with its geotransport position, the network of roads, and the general Zagreb “genius loci” is the basic guiding thought of this paper. In order to explain this connection, after the explanation and presentation of the natural and geographic position of Zagreb at the intersection of large geographic regions of Europe, where the Danube area is closest to the Mediterranean, via the indicators of rank of more important towns based on their demographic size, located in the regional settings of 250 kilometres, and presentation of the dynamics of movement of the population over the past one hundred years, the authors also presented the rank and significance of Zagreb among ten singled out towns in the regional environment, and long-term demographic growth and modern demographic and other significance of Zagreb and its region and of Zagreb itself as the centre of the Croatian state. This paper includes the indicators of the urban system in Croatia in relation to the largest town by application of the rank-size rule and the urban primacy index. In this latter, the thesis that there is a causal-consequential connection between the size of city centres and their functional significance is confirmed.

The part of the paper regarding the dynamics of growth of the total number of inhabitants from the oldest official census in 1857 to the last one in 2011 emphasises the high degree of mutual connectedness in the physical distribution in the area of the Zagreb region, especially between the central settlement Zagreb and the Zagreb surroundings in the period 1948-2011 that witnessed the mutual intertwining of the process of polarisation and the process of expansion of the population in the researched area in which the surroundings exceedingly assume the function of demographic growth from Zagreb. Thus, in the observed period, especially from 1980-2015, the process of metropolisation or suburbanisation of Zagreb into the surroundings becomes more intensive.

Differences in the distribution of the population by area require measures of an active redistribution policy with the aim of further planned re-routing of the newly settled population and routing of intra-regional migration movements. This can be achieved primarily by creating attractive measures in the

local economic settings with the aim of increasing the number of jobs, creating conditions for residential construction in the neighbouring settlements, but also improving all components of the local transport system and modernisation of roads, construction of communal infrastructure, construction and dislocation of the required public institutions in the wider area of the urban region. This would contribute to the alleviation of the situation in Zagreb and enable demographic and overall revitalisation of the surrounding area.

Developmental and resultant economic disparities in the area require a complex and permanent system of incentives directed primarily at the implementation of strategies, programmes, and projects of long-term development of the City of Zagreb and the urban agglomeration Zagreb, elimination of developmental restrictions and increasing use of comparative developmental advantages in order to boost the value of the city and of the city surroundings and to create better conditions for the stay of the population, return flows, and further settlement. This should be encouraged through joint strategic development documents, programmes, projects, and measures at city and county level, but also through development programmes at local levels.

Regarding county organisation, this paper presents a critical view of the demarcation of this area into two counties. In any case, it would be desirable to form a single county, but possibly without certain peripheral areas of the current County of Zagreb. In that case, the City of Zagreb would objectively be able to have a more significant impact on the more uniform demographic and overall development of this functionally interconnected space. The present area of the County of Zagreb is surely an area of growing developmental expansion of Zagreb and an area of its future metropolitan development. The legal definition of towns in Croatia should also be examined critically, including the change of criteria used to date in terms of the number of inhabitants and daily migrations.

Future development of the city and its surroundings requires planned harmonisation of all component parts of the physical structure of this area and active co-operation of towns with the neighbouring towns and municipalities on the implementation of joint development projects. This co-operation is in the mutual interest of the current two counties and their units of local self-government, which would enable more rational use of the natural and human resources and reduce internal migration, and Zagreb would also find it easier to resolve its problems regarding the concentration of the population, economic and other social concerns.

Finally, one may conclude that more favourable demographic trends in the City of Zagreb and concerning the re-distribution of the population between the city and its surroundings in the period ahead can be achieved by raising the level of economic growth and through accelerated implementation of important economic and infrastructural projects, including the modernisation and integration of transport and roads, growth and re-distribution of jobs in the wider Zagreb area, and in connection with the development of housing, social and public infrastructure in the totality of the area treated.

Such development would definitely be intensified, among other things, by the strengthening of the capacity of city and project-related regional development institutions, implementation of development strategies and other strategic planned documents, and development projects arising from them in the area of the Zagreb city agglomeration, where the leading role of Zagreb is

irreplaceable, including the expected support from the programmes, projects, and financial mechanisms of the European Union.

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