Czech University of Life Sciences Prague

Faculty of Economics and Management

Department of Economics

Diploma Thesis

Public space as one of the key elements of urban environment in relation to real estate prices in Krasnodar and Prague

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CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

DIPLOMA THESIS ASSIGNMENT

Alexey Speshilov

Economics and Management

Thesis title

Public space as one of the key elements of urban environment in relation to real estate prices in Krasnodar and Prague

Objectives of thesis

- Rendering fundamental approaches to urban areas' studies;
- Identifying the role of urban areas in a global economy;
- Linking urban restructuring of recent years to changes in the world economy;
- Investigating the concept of urban environment and its components;
- Defining urban areas as a collection of spaces;
- Emphasizing the crucial role of public space among other components of urban environment;
- Evaluating the influence of public spaces in Krasnodar and Prague;
- Assessing the impact of proximity to public spaces on the formation of real estate prices in Krasnodar and Prague by applying econometric model.

Methodology

Both qualitative and quantitative methods are used: development strategies document analysis, statistical data analysis (factor analysis and dispersive analysis), hedonic price method and multiple regression analysis in econometrics, secondary resources study.

The proposed extent of the thesis

60 pages

Keywords

Public space, urban environment, urban areas, urban economics, hedonic price model, real estate prices, Krasnodar, Prague.

Recommended information sources

Fujita, M., Krugman, P., Venables, A.J.: The Spatial Economy. Cities, regions, and international trade. The MIT Press, 1999

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Declaration

I declare that I have worked on my diploma thesis titled "Public space as one fo the key elements of urban environment in relation to real estate prices in Krasnodar and Prague" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the diploma thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 30 March 2016   _____

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I would like to thank my supervisor Ing.Petr Prochazka for sensible advice and my parents and friends for daily unstinting support.

Veřejný prostor jako jeden z klíčových prvků městského prostředí ve vztahu k cen nemovitostí v Krasnodaru a v Praze

Souhrn

Diplomová práce je zaměřena na studium městského prostředí jako sbírky fyzických, ekonomických, sociálních, kulturních a veřejných prostranství. Veřejný prostor městského prostředí jako jednu ze svých klíčových prvků jeví začlenění vlastností všech uvedených prostranství, zatímco kombinování ekonomických, sociálních a kulturních aktivit je na jeho fyzických funkcích. Autor identifikoval procesy globálního působení městských oblastí a jejich speciální funkce v globální ekonomice. Možné způsoby budoucího městského rozvoje byly navrhnuty tam, kde moderní aktivity jsou spojeny s městskou restrukturalizací. Vývoj procesů s nemovitostmi byl v diplomové práci úspěšně spojen s celkovým rozvojem měst. Vliv veřejných prostranství, konkrétně vliv jejich vzdáleností na ceny bytových nemovitostí, byl odhadnut sestavením dvou ekonometrických modelů pro města Krasnodar v Rusku a Prahu v České republice.

Klíčová slova: Veřejný prostor, městské prostředí, městské oblasti, městská ekonomika, metoda hedonické ceny, ceny nemovitostí, Krasnodar, Praha.

Public space as one of the key elements of urban environment in relation to real estate prices in Krasnodar and Prague

Summary

The diploma thesis is focused on studying the urban environment as a collection of physical, economic, social, cultural, and public spaces. A public space of an urban environment as one of its key elements seems to incorporate characteristics of all the mentioned spaces while combining economic, social and cultural activities and tying them to its physical features. The author identified the processes of urban areas going global and the special features of urban areas' functioning in a globalized economy. The study of modern activities tied to urban restructuring was provided where the possible ways of the future urban development were proposed.The real estate development processes in the diploma thesis were successfully linked with the overall urban development. The influence of public spaces, and namely the influence of proximity to them on the real estate prices of residential properties, was estimated by constructing two econometric models for the cities of Krasnodar, the Russian Federation, and Prague, the Czech Republic.

Keywords: public space, urban environment, urban areas, urban economics, hedonic price model, real estate prices, Krasnodar, Prague.

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1 Introduction

A vast majority of post-Soviet cities and towns in Russia that have recently experienced a changeover from the planned economy to the market one and generally cities and towns of Central and Eastern Europe have undergone a dramatic growth due to the sudden opportunities for the commercial development and the sudden lack of planning tools. Apparently, such cities require a closer attention to the development of strategies that can lead to an increase in interest in the city, cash flows and inflows of investments, as well as to the clear urban regulation with a proper priority placement. That is why urban studies and namely the studies of urban economics providing a comprehensive analysis and a study of issues related to the functioning and development of urban centers now is one of the prime areas of focus.

Clearly, the growth of the cities at the end of 90's and at the begging of 00's in a way was self-sustainable but both chaotic. The result of cities transformation to a metropolis is possibility of a loss of control of economic and social factors. Growth of the city becomes spontaneous, there come more and more residents, the costs and prices go higher but not because of the quality growth but because of the congestion growth. At the same time the city ceases to perform its social and cultural functions which consist in transforming the surroundings and environment and in transmission of the culture. This is the reason for the urgent creation of the urban development strategy which besides many other ways can be implemented through the development of various spaces of a city: physical, economic, social, cultural, and public space as uniting all the mentioned before.

Therefore, the urban environment as a whole and a city as a collection of spaces become the objects of our research. The subject of our research is public space in particular in relation to real estate prices in the cities of Krasnodar, the Russian Federation, and Prague, the Czech Republic.

The thesis starts with the defining the hypothesis and the main objectives of the research. Based on the objectives, the methodology applied is being described. The literary review provides the synthesis of the primary approaches to studies of urban areas and their development through time, states the current role of urban areas in the globalized world economy and indicates the running processes of urban restructuring. An urban area in the literary review is defined as a collection of physical, economic, social, cultural and public spaces, each of which is given a detailed account of. The practical part of the thesis is concerned with the evaluation of the role of public spaces in the urban economies in relation to the real estate prices of residential properties in the cities of Krasnodar and Prague. The overview of both cities is provided including general relevant information about the cities as well as the situation of the real estate markets. Two econometric models were constructed to access the impact of proximity to the city center and the nearest public spaces on the real estate prices. The results of the research are summarized in the end of the thesis and are incorporated in the conclusion.

2 Objectives and methodology

2.1 Objectives

The goal of the research is to prove the hypothesis that a public space is a one of the key elements of any urban environment by evaluating the influence of public spaces on the formation of real estate prices for residential properties. To do so, the certain research questions were formulated. What is an urban environment and what elements does it consist of? What are the studies of urban areas currently concerned with? What is the nature of a public space of a city? How does it influence urban real estate processes and namely the prices formation?

To answer all these questions the following objectives were formulated:

- to specify existing approaches to studies of urban areas and follow their development;
- to identify the role and functioning of urban areas in the world economy;
- to analyze the current processes of urban restructuring;
- to define the concept of urban environment;
- to determine the peculiarities of a physical space of an urban environment;
- to study the essence of an economic space of an urban area;
- to examine the features of social and cultural spaces of an urban environment;
- to scrutinize the public space of an urban area and to point out its importance;
- to link urban development with the real estate development processes;
- to construct econometric models for the cities of Prague and Krasnodar to evaluate the impact of public spaces proximity on real estate prices for residential properties.

All of the mentioned objectives were represented in the chapters of the diploma thesis.

2.2 Methodology

In the diploma thesis both qualitative and quantitative methods of research were applied. Quantitative research is a more logical and data-led approach which provides a measure of what people think from a statistical and numerical point of view. Quantitative research can gather a large amount of data that can be easily organized and manipulated into reports for analysis. Unlike quantitative research which relies on numbers and data, qualitative research is more focused on how people feel, what they think and why they make certain choices. Combining these two sets of information can produce insightful results for a looking to learn more about people's opinions, preferences and reactions.

Basically, the following methods of research were used: document analysis, statistical data analysis, the overview of media and deep study of other secondary

resources. Being a part of a city, residents, participant observation method was also included to the diploma thesis.

To construct econometric models the hedonic pricing method was applied. The basis of the research on hedonic price models was laid by Kelvin Lancaster in when he applied a hedonic model to evaluate housing prices (Lancaster 1966). His ideas were later developed by McFadden who assumed that real estate prices were determined by the features of dwellings and that the perceived value of a unit is individual and therefore different for every household and person (McFadden 1980). Since then, hedonic price models have undergone various developments and adjustments, for example, Bajari, Benkard and Levin altered a model of Rosen in order to avoid criticism for assuming that individuals make up a homogeneous group (Bajari, Benkard, Levin 2007).

Previous techniques of valuation that were grounded on the properties' comparability and area cap rates seem to depreciate the value of assets on various markets despite the fact that the basement for such valuations hasn't been altered. It is now a question what a proper approach is to finding the value of assets and evaluating the potential of future acquisitions and developments. According to Monson, at present at the climax of the recent real estate cycle, the fundamental principles of the real estate framework was lost due to the abundance of offers that led to overbalance prompted by reasonable capital looking for deals (Matt Monson 2009). Consequently, the market value of a real estate property became greater than its true intrinsic value. Comprehension of the intrinsic value of a real estate property and the features that influence its possible and potential transaction price ad market value is essential for the appropriate valuation and can be calculated only by scrupulous calculations.

Due to the defined and fixed location of a real estate asset, the differences in their geographical allocations and the individual character of its physical features, statistics can be a priceless tool for determining an intrinsic value of a property. Statistical tools have been developed to assist in determining such values, and include regression analysis and hedonic modeling.

Regression analysis can be used for different purposes (Freedman 2005):

1) To summarize data;

2) To predict the future;

3) To predict the results of interventions.

The first two points – data analysis and the forecast based on this analysis – will be our focus.

In statistics, linear regression is an approach for modeling the relationship between a scalar dependent variable y and one or more explanatory variables denoted X. The case

of one explanatory variable is called simple linear regression. For more than one explanatory variable, the process is called multiple linear regression (Freedman 2005).

In linear regression, data are modeled using linear predictor functions, and unknown model parameters are evaluated with the help of the data. Most commonly, linear regression refers to a model in which the conditional mean of Y given the value of X is an affine function of X. Less commonly, linear regression could refer to a model in which the median, or some other quantile of the conditional distribution of Y given X is expressed as a linear function of X (Freedman 2005). Like all forms of regression analysis, linear regression focuses on the conditional probability distribution of Y given X, rather than on the joint probability distribution of y and X, which is the domain of multivariate analysis.

Linear regression assumes that the relationship between two variables, x and y, can be modeled by a straight line:

$$y = \beta_0 + \beta_1 x$$

(1)

where β_0 and β_1 represent two model parameters. These parameters are estimated using data, and we write their point estimates as b0 and b1. When we use x to predict y, we usually call x the explanatory or predictor variable, and we call y the response (Diez, Barr, Chetinkaya-Rundel, 2012).

Standard linear regression models with standard estimation techniques make a number of assumptions about the predictor variables, the response variables and their relationship. Numerous extensions have been developed that allow each of these assumptions to be relaxed (i.e. reduced to a weaker form), and in some cases eliminated entirely. Some methods are general enough that they can relax multiple assumptions at once, and in other cases this can be achieved by combining different extensions. Generally these extensions make the estimation procedure more complex and time-consuming, and may also require more data in order to produce an equally precise model.

The following are the major assumptions made by standard linear regression models with standard estimation techniques (e.g. ordinary least squares) (Goldberger 1998):

1)   Weak exogeneity. This fundamentally means that the predictor variables x can be treated as fixed values, rather than random variables. Although this assumption is not valid in many cases, ignoring it will result into prominently more difficult errors-in-variables models.

2)   Linearity. This means that the mean of the response variable is a linear composition of the parameters (regression coefficients) and the predictor variables. It

should be noted that this assumption is much less binding and limitary than it may at first appear.

3)   Constant variance (homoscedasticity). This means that different response variables have the identic variance in their errors, regardless of the values of the predictor variables. In point of fact this assumption is invalid (i.e. the errors are heteroscedastic) if the response variables can alter over a wide scale. For the purpose of determining for heterogeneous error variance, or when a pattern of residuals violates model assumptions of homoscedasticity (error is equally variable around the 'best-fitting line' for all points of x), it is reasonable to look for a "fanning effect" between residual error and predicted values. Generally, for example, a response variable whose mean is large will have a greater variance than one whose mean is small. Simple linear regression estimation methods give less precise parameter estimates and misleading inferential quantities such as standard errors when substantial heteroscedasticity is present. However, various estimation techniques can handle heteroscedasticity in a quite general way. Bayesian linear regression techniques can also be used when the variance is assumed to be a function of the mean. It is also possible in some cases to fix the problem by applying a transformation to the response variable (e.g. fit the logarithm of the response variable using a linear regression model, which implies that the response variable has a log-normal distribution rather than a normal distribution).

4)   Independence of errors. This assumes that the errors of the response variables are uncorrelated with each other. Some methods (for example, generalized least squares) have the ability of handling correlated errors, although they usually call for notably more information unless some sort of regularization is used to bias the model towards assuming uncorrelated errors. Bayesian linear regression is a general way of handling this issue.

5)   Lack of multicollinearity in the predictors. For standard least squares estimation methods, the design matrix X must have full column rank p; otherwise, we have a situation of multicollinearity in the predictor variables. This can be caused by having two or more absolutely correlated predictor variables (e.g. if the same predictor variable is given twice by mistake, either without changing one of the copies or by transforming one of the copies linearly).

One of the major aims of constructing a hedonic price model is to generate a model that would allow accurate predictions. Unlike many other assets, the value of unique features of real estate properties is not obvious. Nevertheless, hedonic price models are designed to evaluate the influencing effect of these features on the final market value or on the final transactional price. These models are constructed with the use of coefficients that are developed from a regression analysis. This relationship can be described as "market price is a function of each tangible & intangible building characteristic and other outside influencing factors." This is illustrated in the following equation:

Market Price = f (tangible & building characteristics, other influencing factors)

Hedonic models can also be instrumental in answering the following questions:

- How should real estate be valued in the absence of a market?

- How do intangible characteristics - such as proximity to a public place - affect price?

- How should one account for an asset's value in non-revenue generating circumstances?

Answers to these questions depend on the data collected for properties that have a certain market value which is provided and that are in a way similar for allowing the comparison. After the data is collected the regression analysis can be applied in order to identify the correlation of for each of the feature – both physical and spatial – against the market value or the transactional price. These correlations later will be used for constructing a hedonic price model which will assist in determining the expected price of a real estate asset.

As an alternate real estate valuation method, hedonic modeling can be used by developers, corporate real estate groups, owners, and operators to determine which building characteristics add significant value to the potential transaction price. The results produced can provide important information for future decisions and help each party better understand the economics surrounding each asset, thus improving asset underwriting.

3 Literature Review

3.1 Changing approaches in urban area studies

As the world is constantly changing making immense alterations and elaborating in its complexity the approaches towards studying urban categories are evolving, most of them undergoing drastic changes. The studies of urban phenomena are gaining wider perspectives as more and more angles are being discovered.

The early studies of space and its constituents were chiefly concerned with its physical characteristics as the determining factors in the location, growth and advancement of communities. These views however were replaced in all but, according to T. Hall, historical and rural studies as settlements have grown in size and complexity (Hall 2000). This could be explained by the fact that original location factors shifted due to the verve of urbanization and lost their original importance as shapes, forms and functions of urban areas changed. One of the reasons for that is the Industrial Revolution when the first attempts to investigate spatial patterns took place in Germany.

3.1.1 German school of fundamental urban location studies

Johann Heinrich von Thunen is perhaps the first researcher of location analysis. A son of a farmer, trying to figure out the best spatial organization of agriculture, possibly was the first one to ask the question: why certain economic and other activities happen in a certain place? Thunen is now famous as a founder of the first location theories. His work The Isolated State offers one of the earliest models of economic geography (Wood, Roberts 2011). Although this model appears to be quite fictional, it embraces a certain degree of a traditional model-builder's context: representing an ideal landscape, Thunen makes it clear that it should be built upon the principles of rationality and equality. The researcher was calculating a renting price for land assuming the steady prices for crops and inputs and having only one way of transportation – a horse and a cart – which would mean that transportation costs would be in proportion with distance (von Thunen 1966). Therefore, the price for renting land was a function of the value of its crop – or, as indicated by Wood and Roberts, the difference between the sales price of products and production and transportation costs (Wood, Roberts 2011). In his model Thunen determined what ways of possible land use would generate a maximum land rent prices for lands situated at different distances. Consequently, Thunen proposed a rational allocation of land uses around the town.

Thunen's contributions to analyzing land use possibilities were later developed and refined. As economies grew larger, became more diverse and elaborated, Thunen's ideas were adopted and applied in other spheres of life besides agriculture. Using the ideas of the German researcher, such economists as A. Marshall (Marshall, Guillebaud 1961), R. Hurd (Hurd 1924), W. Alonso (Alonso 1964) developed the notion of the spatial differentiation of land use in cities. It should be noted that Alonso's "monocentric city model" influenced by Thunen again paid attention to concentration rings of land use and even now remains

one of the basis works for theoretical and empirical literature. A primary idea of Thunen that a bid price curve links land price to land use has been later applied to commercial, residential, and industrial urban sectors.

The tradition laid by Thunen was carried on by Alfred Weber. From the works of Thunen to the works of Weber cities of Germany have changed dramatically – their districts were transformed into manufacturing centers, discarding their former focus on agriculture. Weber was fascinated by the rapid growth of urban centers and their erratic spatial development. That is why in his works he is trying to explain "the iron chains of hard economic forces" that affect location patterns (Weber, Friedrich 1929, p.3).

Weber focuses his attention mainly on the location patterns of manufacturing industry which had a tendency to advance either in or close to the sources of raw materials. However, markets for industrial products at that time were quite far from the place of their origin (Wood, Roberts 2011). Alfred Weber developed a theory which helped to identify the best possible industrial location for a factory. In a way Weber's model is an elaboration of Thunen's model as he assumed a steady location with transportation costs depending only on distance but unlike Thunen he appointed several population centers and distinguished between ubiquitous and localized raw materials (Weber, Friedrich 1929).

Weber's model can be characterized as a least cost model of industrial location as he supposed the optimal location for production would be determined by the lowest costs. The researched analyzed both transport costs – the costs of transportation of raw materials to the manufacturing center and of getting products to the market – and labor costs dependent on the intensity of manufacture and relative to row materials. Then he subsequently added complicating factors in order to make the model closer to reality. It is interesting that one of these factors was the effect of agglomeration (Weber, Firedrich 1929).

The result of the model is a triangle representing the industrial location problem the corners of which are a production factory, two raw materials inputs from different location and a market (Weber, Friedrich 1929). There are two ways of calculating the best possible location of the factory: mechanical, offered by Varignon Frame, and geometrical, proposed by Georg Pick (Wood, Roberts 2011). The triangle is also a significant tool to identify if production process is weight loosing or weight gaining. Weber introduces the term "material index" when if being bigger than 1the optimal location will be situated closer to the localized raw material source or if less than 1 – closer to the market. Another essential part of the model is that Weber applies not only materials, market, and transport costs, but also factors of labor and agglomeration.

Weber's theories of industrial location made significant contributions to the fields of economics, economic geography and regional science helping to change the spatial distribution of industry profoundly. We can still see the traces of Weber's ideas in the field

of policy making where a lot of local, regional or even national development strategies are based on attracting industry by offering lower costs (Wood, Roberts 2011).

The development of urban studies continued with works of Walter Christaller, who is famous for his theory of the distribution of settlements. In 1940 Christaller obtained employment in the Planning Office headed by Himmler where he had a chance to apply his central place theory for developing planning strategies for countries invaded by Germany. As some of the researches have claimed, these facts make studying Christaller's ideas somewhat "disconcerting and spooky" (Barnes 2002, p. 10).

Christaller pinpointed his attention upon the spatial patterns of distributions of settlements and the possible reasons for them. He wanted to answer the questions why cities and towns are where they are, why they are shaped this way or how they relate to each other. The researcher focused on identifying "special economic-geographical laws" (Christaller, Baskin 1966, p.3) by elaborating the methodology of Alfred Weber. Nevertheless, unlike Weber and Thunen, who based their theories on production, Christaller looked into the patterns of goods consumption. According to him, central places are the places where the goods or services are distributed and as he puts it, "the consumption of central goods is decisive in the development of central places" (Christaller, Baskin 1966, p.35). In his theory each product has a minimum level of demand and its range which the researcher defines as a distance a consumer is ready to cover to purchase a good or a service offered at the central place. Therefore, it creates a possibility to map a market area for each product. When the range exceeds the minimum demand, there is a greater opportunity to generate a profit.

Christaller understood that the range in realty will be affected by many additional factors like population density, transportation systems, spatial shape of a central place and others. The range will be also influenced by the presence of other central places, thus Christaller unlike Thunen and Weber focuses on the regional level with more than one market or central place. He also alters their functions from being supplied to being a supplier. Christaller developed a geometric model for multiple central places with market areas in the form of polygons, when a hierarchy of central places forms a hexagon. This allows to illustrate the urban hierarchy when as, for example, in the K-3 model a number of central places at a certain level is served by central places at a higher level according to marketing principles. This K-3 model describes the urban system with the major central place as the top of the hierarchy with three central places of the next order and so on. Therefore, there exist both horizontal and vertical orders (Beavon 1977, Garner 1967).
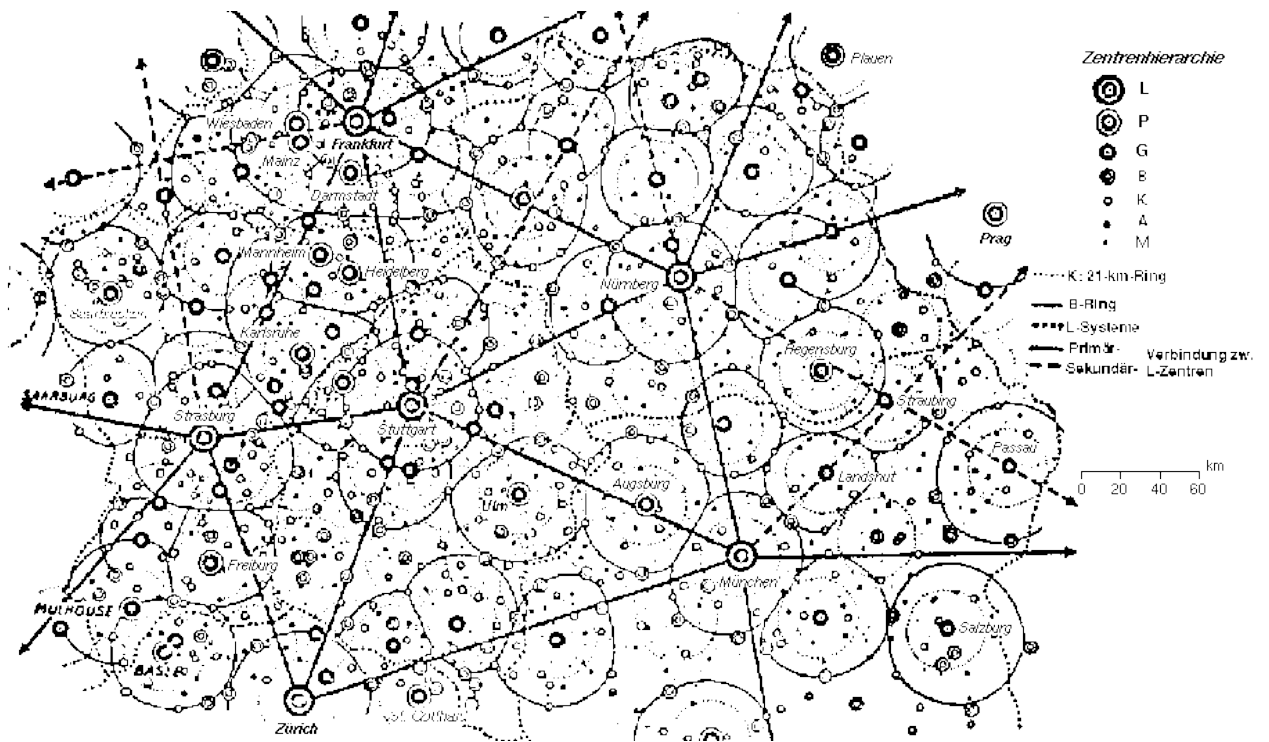
Picture 1.The scheme of urban locations by W. Christaller (Christaller, Baskin 1966)

Despite the "growing beauty" of hexagons, Christaller's theory was often criticized for its perfectly ordered landscape when the real places often represent deviations from the ideal patterns (Bunge 1962, p. 129). His model of central places has started a discussion about what is better for settlements: to grow naturally or be organized in an orderly way? (Wood, Roberts 2011) August Losch tried to answer this question in his work The Economics of Location.

August Losch proposes to "view all economic activities geographically" (Losch 1954, preface). The researcher was set on active actions – by studying location patterns he wanted to find a way to improve our "sorry reality" (Losch 1954, p. 6). His model was based on the idea that the best possible location depends mainly on individual decisions makers who would prefer to allocate their firms where the net profit is the greatest. As Losch points out, net profit arises from various factors thus he criticized Thunen and Weber for their one-side focus. However, after Christaller he sets a hexagon to be the model of a marketing area. What is different from Christaller's model, where al central places would offer the same range of goods and services, is the specification of urban hierarchies. Losch argued that there are far more possibilities for market arrangements in urban structures which resulted in the network of hexagons characterized by high-order and low-order landscape sectors. Losch specified these sectors as "city-rich" and "city-poor" making it clear that places at the same level of hierarchy will be able to produce different range of products and services (Losch 1954, p. 34). The definition of "city-rich" and "city-poor" sectors also allowed making conclusions about sub regional development.

Overall, the Losch model of rotating nets hexagons is considered to be more applicable to reality as it is more complicated and flexible than the ones before (Wood, Roberts 2011).
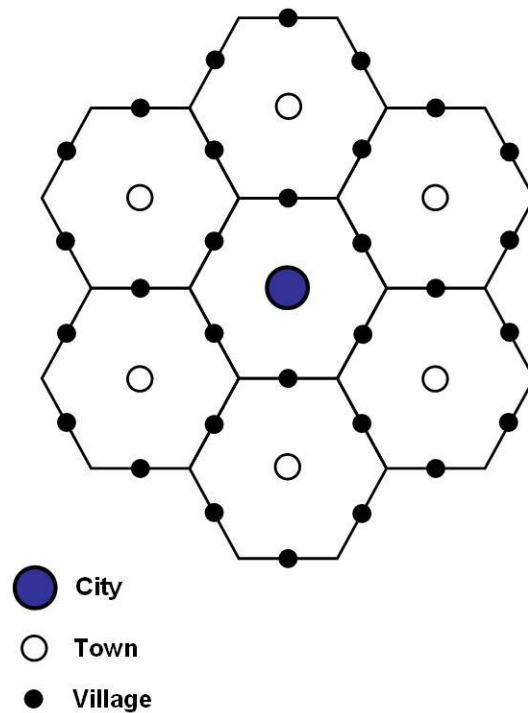
Picture 2.The illustration of the location theory by August Losch (The external structure of cities 2016).

Losch's theory considering the interactions of economic behavior and space proved to be influential both for economic and urban geography as well as to the geometrical and mathematical fields of science.

3.1.2 Urban morphology

Urban morphology is an important root of urban geography, economics and many other studies. Patrick Schirmer defines urban morphology as a "study of the forms of human settlement at different scales" the primary aim of which is to explain their spatial structure and the essence as well as the factors of their development (Schirmer, Axhausen 2015). It originated as a descriptive approach that focused on analyzing urban development by looking into the phases of growth of settlements (Hall 2000). Now, however, this approach has evolved into the applied one where the analysis is usually carried on based on the cartographic data or geodata which illustrates the physical framework of the studied environment – constructions, open spaces, streets, and other components of urban environment (Schirmer, Axhausen 2015). Investigating this environment allows making a blueprint of its future usage or of the changes of its present usage, provides an insight of its possible activities.

This approach appeared to be an object of criticism in 1950s and 1960s when other scientific approaches started to develop but not long ago it was reintroduced due to the

fresh ideas and a growing importance of the roles of architects, planners and urban managers. The recent development of urban morphology is also connected to the progress of discrete choice models that link processes of an urban area to the behavior of its actors – residents and enterprises (Train 2003). Another impulse for its revival is the use of new digital technologies to encourage morphological studies and "to build bridges to contemporary urban design processes" (Gil et al. 2012).

The variety of morphological urban researches now is quite wide. Gil uses its methods to determine morphologic urban typologies by cluster studies of buildings and streets (Gil at al. 2012),Dillenburger provides an instrument for searching morphologically alike buildings (Dillenburger 2010), Ewing and Handy apply morphological tools for street analysis (Ewig, Handy 2009).

3.1.3 Positivist approaches

Despite the fact that positive philosophy originated in 18th century, its influence reached urban studies only one hundred years later – positive philosophy started affecting urban studies in 1950s which can be explained by the increased potentialities of computers that made analyzing complex statistical sets of data possible.

Positive philosophy rests upon the idea that human behavior is set by universal laws and demonstrates certain constancy. The goal of positivist approaches is to identify these laws as well as to evaluate their influence on geographical patterns. Tim Hall breaks these approaches down to two types – ecological and neo-classical (Hall 2000).

As claimed by Hall, ecological approaches are built on the assumption that ecological principles are in charge of human behavior which means that the most affluent actors would derive the most beneficial position in a given space, for example, the best place of residence (Hall 2000). This movement issues from the Chicago School of sociology from the beginning of the 20th century when it was first factored into by land use Burgess's concentric zone model and Hoyt's sector model. Burgess is considered to be the first scientist that tried to give an explanation to the distribution of social groups within cities (Henslin 2014). The model describes an urban area as a set of concentration rings each of which is characterized by a specific land use with the central ring being a business district followed by a transition zone, worker's houses, a zone of desirable residence and a zone of commuters (Rodrigue, Comtois, Slack 2013). Later Homer Hoyt adjusted Burgess's model by introducing factors that were left out of consideration before, mainly the impact of transport axis. Hoyt argued that urban areas are made up from not circles but rather sectors thus supplementing the forces of direction and rime to the force of distance. His model asserts that various sectors of an urban area are formed by transport corridors; therefore transportation systems have a direct influence on the land use (Rodrigue, Comtois, Slack 2013). Following the ideas of Hoyt, Chauncy Harris and Edward Ullman proposed an improved way of urban land uses aggregation. Their model is based on the assumption that cities grow not around a central district but by initiating several separate

nuclei in their spatial structure. With the future development of urban areas these nuclei become individuated in their functions and determined by such factors as accessibility, land use possibilities, and location suitability (Harris, Ullman 1945).

Neo-classical approaches were also founded on a belief that human behavior can be predicted knowing that its main driver was rationality. Rationality therefore was defined as minimizing the costs and maximizing the benefits and this way of behavior was referred to as utility maximization (Hall 2000, p. 21). The neo-classical approaches are grounded on the belief that the development of urban areas is purely economic in its nature and are possible due to market activities and competition. Following the economic equilibrium theory, the distribution of urban areas by size and functions is determined by supply and demand relationships that comply with the rule of utility maximization (Liu 2009). These approaches are illustrated by the Wingo's model of residential land development, and the model of urban structure by Alonso and Lowry.

LowdonWingo in his "intra-metropolitan" research has designed a model that took into account a transportation demand keeping a spatial connection between home and work in mind (Wingo 1963, p. 1). By investigating transportation and location costs, Wingo found a locational equilibrium for the allocation of household with certain rent-pay possibilities to places with a certain rental structure (Wingo 1963). According to the utility maximization principle, Wingo constructed a rent and residential population density slope which declined from the center to suburbs (Wingo 1963). Alonso's model is similar to the model of Wingo in a way that transportation costs and size indexes were emphasized as well. Alonso, however, went further and set his theory in the microeconomic context of consumer behavior. In his model the scientist specified that a bid-rent curve is a set of a sum of rent and transport inputs. The model states that the increase in earnings will result in an increased density of poorer population in the city center while the rich would prefer to live at lower densities closer to suburbs (Alonso 1964). Both Alonso and Wingo generated ideas considering location and prices of space in relation to market centers thus establishing a spatial economic theory of urban systems (Batty 1976).

Another approach to urban modelling was introduced by Lawry who described an urban system as "consisting of sites and establishments and transaction periods" – the major conditions for the proper functioning of land market (Batty 1976). Lawry's model was built on two assumptions: that residential population density directly depends on the location of employment centers and that service sectors of an urban area are influenced by their accessibility to the customers whose impact therefore decreases with the distance to the sector. Besides dealing with population and service employment, the model allocates certain activities to certain zones according to their potentials (Lowry 1964).

Overall positivist approaches presented the general rules that could be applied to processes of urban growth and urban structure. Nevertheless, the models constructed from

the positivist point of view became the basis of many other studies and were later developed and adjusted in the context of behavioral and humanistic urban studies.

3.1.4 Behavioral and humanistic approaches

Both behavioral and humanistic approaches to urban studies were developed in a form of a criticism to positivist approaches. While ecological and neo-classical approaches focused primarily on utility maximization, behaviorist approach sought understanding of what motivates people, what influences their decision making, how people relate to the surrounding environment. In a way behavioral approach disregarded a concept of economic rationality and utility maximization principles (Wringley, Bennet 1981). Humanistic approaches were investigating deep, subjective and complicated relationships between people and places (Hall 2000). This approached was meant to make a rough and soulless urban landscape more vivid and cheery (Relph 1976).

Both of these approaches unlike positivist ones were less concerned with generation of urban growth models as they were mainly directed at producing substantive analyses and interpretations of relationships between people and their environment (Guhathakurta 2003). A model designed at the University of North Caroline by Stuart Chapin is a good source of illustration of the ideas of the area. The focus of the models, Chapin and his colleagues proposed, was set on the patterns of urban growth through time and on definition of the growth as a function of the physical infrastructure and the facilities of access within different parts of urban environment. Therefore, urban development was regarded as a result of human actions with the value system of a society being a major reason for these actions. Chapin and his colleagues identified four elements critical for the framework of their studies: value system, patterns of human behavior, urban development, and the control process (Chapin, Weiss 1968).

The application of behavioral and humanistic approaches to urban studies helped to understand processes of making decisions connected with urban planning. Their perspectives broadened the traditional framework of urban studies by linking spatial systems with individuals and groups and by concentrating on the relations between people and places.

3.1.5 Structuralism approaches

Structuralist approaches to urban studies were mainly concerned with the determination of socio-spatial relations by the "dominant mode of production" (Hall 2000, p. 23). One of the major goals of this approach was to merge structural and human dimensions of urban studies thus avoiding criticism about reductionism. This kind of structural analysis was significantly influenced by works of Karl Marx and Friedrich Engels.

The basis of their understanding of the nature of the occurrence of the cities is the process of separating the material and spiritual work (Marx, Engels 1955). For Marx the city is a social system that triggers mechanisms of class stratification, division of labor,

separation of the industry and trade platform becomes a clash of interests of various communities. Marx pointed out that the development of cities and their specialization is largely determined by level of development of their infrastructure and institutions. In Marx's definition of class hierarchy of priorities the nature of work divides urban space, determining the space-time continuum of the city as a whole. Marx, considering the problems of the city, raises the question of town-ray of generality, the occurrence of which is due to the increasing complexity of urban systems (Marx 1968). The work of Engels "Condition of the Working Class in England", which became a classic description of the workers during the Industrial Revolution, gives an exhaustive analysis of the situation in the working environment, the suffocating atmosphere of life of employees in a number of British cities (Engels 1968). Both Marx and Engels dwelled upon various indicators of an industrial city and pointed out that historical progress is a step on the way to the economic development. The spatial separation of a city and a country acts as a background, forming classes and defining the nature of work of urban and rural residents.

3.1.6 Recent approaches to urban location studies

Due to the crucial role of cities in a world economy the development of theories considering of urban growth in recent years has become one of the most significant topics of research. Economic restructuring of the past thirty years has inverted the shape of urban spaces drastically. As economic control has been obtained by multinational corporations and financial institutions, production and population have become decentralized (Fainstein, Campbell 2002). The new patterns of production, employment and distribution have provoked adjustments of land use and social occupation; they have become a reason for transformation of the urban hierarchy and of the economic and administrative links between places (Sassen 2002). The shift from production-oriented economy to information-based one and the following breakdowns in industrial and upsurge in service employment are ones of the popular trends in Europe as well as in the USA (Castells 1996). These processes have been accompanied by the vigorous development of financial and producer services sectors situated with urban areas. Although suburbanization and other phenomena, mentioned above, have generated different political and economic responses in Europe and in the US, current economic restructuring laid the foundation for analogous strategies of deregulation and the support of property development by stimulating public-private partnerships (Squires 2002).

These transformations were tried to be analyzed by various perspectives. As it was pointed by Fainstein, contemporary economic theories try understanding them by studying market competition as the driving force for economic changes within the growing urban environment (Fainstein, Campbell 2002). In this context mainly lower labor costs in developing countries, weaker regulations on newly industrialized countries, decreasing transportation costs are emphasized. To fight with the competition, manufacturers have to look into possible ways to reduce their production costs with one of the most popular solutions being to relocate their production to places with cheap labor costs which definitely changes the manner of cities development all over the world.

More recent studies are focusing on elaborating the concept of global cities and on sustainable urban development. A global city may be defined as a city where "the control of the world financial system rests", a city which cultures have their influences all over the world and a place where business sells its product globally (Fainstein, Campbell 2002, p. 7). The concept of the global city will be described in the thesis later. The concept of sustainable urban development has a long history that started with the works of Rachel Carson in 1965. Now it can be defined as the "development that improves the quality of human life while living within the carrying capacity of supporting ecosystems" (IUCN 1991). Another more popular definition is that it is the development "that meets the needs of the present without compromising the ability of future generations to meet their needs and aspirations" (WCED 1987). Based on these definitions, Hatfield Dodds offered five approaches to reach sustainable urban development (Dodds 2000): a) sustainable income approach, b) maintaining ecological integrity, c) approach, concerned with inequality, institutions and ecological impact, d) participatory approach and sustainable well-being, e) alternative ethical approach.

Despite the evolution of theories and all the proposed models and speculations, there is still a state of uncertainty about urban environment, its paths and prospects (Hall 2000). However, the lack of totalizing urban theory offers a possibility to look at its concepts from wide range of perspectives. The theories described above provide more or less partial accounts of a city and currently are become less up-to-date as they neglect evolving circumstances affecting the development of urban areas: new technologies, new economic forces, elaboration of governmental forms, and ecological matters. The existing theories of urban studies lay the basis for further investigation with the wide variety of prospects to look into.

3.2 Urban areas in a world economy: going global

Active urbanization has always appeared to be a crucial part of every nation's development strategy toward the strong, unswerving, and sustainable economy. The connection between economic prosperity and urban environment can be illustrated even by the fact that world's biggest and busiest cities are situates in countries with the world's most developed and world's largest economies (Zhang 2011). Not only are cities essential for economic advance, but also they serve as a platform for societal modifications – urban areas are usually centers of social, cultural, educational life, they are centers of artistic and technological innovations. Despite the revolving debates and arguments over negative impacts of urbanizations such as, for example, concentration of poverty or appearance of slums, cities still stand for overall growth while providing opportunities.

The nature of cities, their functions and structure couldn't stay unaffected by economic globalization that started in seventeenth century and was characterized by active urbanization, industrialization, trade and economic growth (McCann, Acs 2010). This was the time when agglomeration effects, studied by Marshall, appeared symbolizing the establishment of cities as the main drivers of economies based on trade and resources

acquisition and echoing their development (Findlay, O'Rourke 2007). One of the most distinct changes over the last years of excessive economic globalization was the increase in capital mobility at local, national and international levels (Sassen 2002). This transnational mobility of capital has become a reason for emergence of new forms of positioning of various geographical areas to each other and for the expansion of these areas' influence in the world economy. For example, this trend resulted in new types of transactional locations – export processing zones or offshore banking centers, for example (Sikka 2003).

Adding urban areas concepts to the studies of economic internationalization opens new prospects and angles of aspects. Firstly, it splits regions or even countries into a set of components that may be essential for explanation of international economic activities. Secondly, it illustrates the influence of large corporations on state authorities as well as a variety of activities which are crucial for realization and operation of a global network of plants, service and market functioning. Thirdly, it puts emphasis on paying attention to the role of place and social and political order which are connected to the functions of the global network. This focus on urban areas makes it possible to identify a locational composition of strategic places on a global scale (Short, Kim 1999).

The alterations of the world economy that took place in the recent years, according to Sassen, have once again underlined the importance of cities as places of certain types of activities and functions. The researcher argues that in the current situation when global diffusion of economic activities is at the same time merged with global integration certain cities and urban areas have acquired a strategic role to play – these locations are defined by the researcher as global cities (Sassen 2002). Therefore the author claims that global cities are: 1) command centers for structuring of the world economy; 2) central locations and markets for top relevant sectors of the time; 3) primal production centers for these sectors, including generation of innovations for these industries (Sassen 2002).

The examples of such global cities may include New York, London, Tokyo, Paris, Frankfurt, Zurich, Sydney, Hong Kong, Seoul and many others, scattered around the world. The volume of transactions between these cities, especially though financial markets, the exchange of services and investments has increased drastically which implied shifts in global economic geography (Knox, Taylor 1995). Such economic growth of urban areas is reflected in the expansion of manufacturing industry, increase of salaries, abatement of economic and social inequality, and establishment of the middle class (Short, Kim 1999).

Another trend for global cities is that overall urban areas have resurrected as objects of social, economic and political studies that dwell on issues of globalization, international migration, spatial politics and many others which means that cities begin to reposition themselves in policy arenas. One of the examples to illustrate this direction is an emerging yet already explicit competition among cardinal cities to enter global markets ranging from financial investments to tourism and recreation (Kresl 2013).

Nevertheless, all the positive points mentioned above do not mean that global cities are not facing any problems. One of them that our research is concerned about is the rapid development of the international property market. These developments imply that real estate prices in the center of New York City will depend on the real estate prices in London or Zurich rather than correspond to the real estate price on the local market (Sassen 2002). Therefore, that leaves no room for small local business to compete with international economic giants.
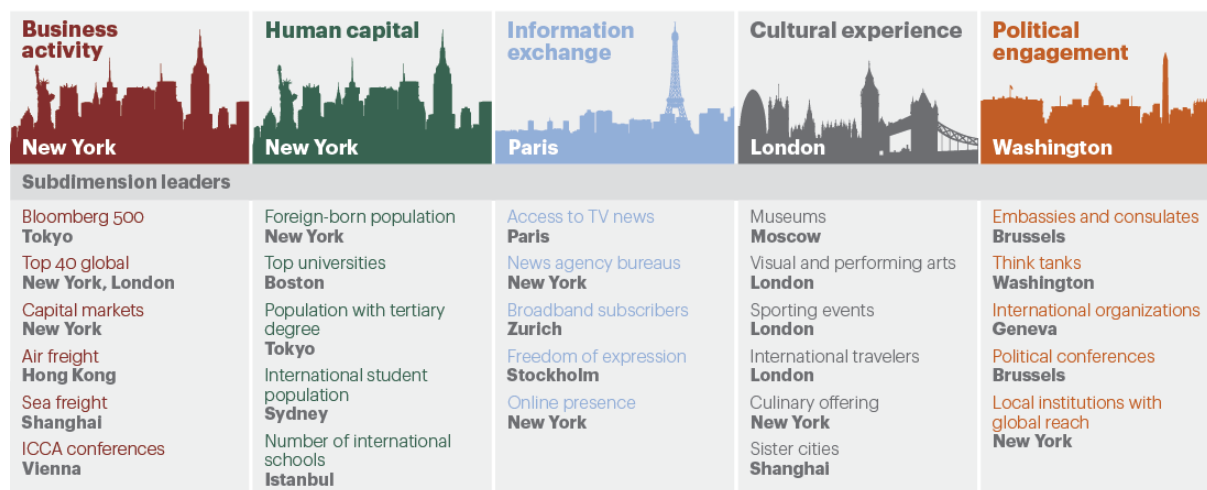
Picture 3. Global Cities Indexes Leaders in 2014 (Leaders around the world 2014)

It is definite that a combination of globalization, advance of technologies, and urbanization will have an immense impact on the national and world economies (Fry 2010). This is the reason for further studies of contributions of urban areas to global economic systems as there still remains a certain degree of vagueness in, for example, defining factors of cities' involvement in international transactions or reasons of one cities being overtaken by others.

3. 3 Urban restructuring and the future of urban areas

What is the future of urban areas in a constantly changing economic environment? What direction should they follow to escape from evanescence? After the Second World War, when industrialization seemed to be a solution that would bring so long-desired economic prosperity, cities were considered to be the basis for stable growth, development, and employment. Now, however, as pointed out by Susan Fainstein, as the world is abundant with commodities peripheral locations have become the most beneficial production sites (Fainstein 2002). It looks like the future of older urban establishments depends on their abilities to keeping up and adjusting their financial, informational, and managerial functions that appoint global capital flows, or find other sources of retaining their competitive advantage – some of the areas can develop their tourism, medical, recreational, scientific or innovation production potentials.

The overall pattern of evolution of urban patterns shows that economic composition of cities seizes to stay constant and is more likely to be subjected to correctives (Harvey 1990). Even though restructuring of production industry in urban areas is now less and less dynamic and may seem to be done soon, the transformations of tertiary industries have possibly just commenced (Fainstein 2002). At the end of the last century many cities have shown readiness to adopt changes that reflected in their regeneration which could be seen in the construction on new offices, boost of employment, gentrified inner neighborhoods. Nevertheless, the internationalization of economy has increased competition in and among urban areas which calls for new challenges for urban systems.

It should be noted that recently urban areas started to get ready to face the challenges facing them – this was the major cause for their restructuring. One of the indicators of the transformation is relocation of corporate headquarters. Corporate headquarters have always been keen on their urban location (Hall 2000). As this remains to be true, except for various multinational and national corporations which have moved to suburban areas or smaller urban settlements, there was a major location shift that illustrated the changes in economic geographies: cities focused on production stopped being attractive to principle business offices that were relocated to cities characterized by service-oriented economies (Knox Agnew 1994). The offices of multinational corporations now tend to concentrate in the largest cities of the world being accommodated in smaller number of global cities (Sassen 2002). The concentration of headquarters in large urban areas shows their request for access to markets of different scales, highly skilled educated professional labor force and a variety of service inputs (Hall 2000). It seems to be expected that these requests seem to be fulfilled by only large, well-connected and well-developed urban areas which explains the current trend of locating corporate in centers of global economy. Corporate headquarters in these cities have become a core of contemporary rapid economic districts that configure the shape both of central areas and wider economies of the cities underpinned by the development of producer services (Baaij, Mom, Van den Bosch, Volberda 2015).

Producer services which are essential for companies and firms to react to rapid market changes while offering a variety of specialized inputs alter urban locational structure significantly (Hamnett 1995). As producer services are primarily situated in the central districts of international financial centers, they exploit innovative medium of such urban areas and the broad running connections to other sectors of urban economy and human capital of the area. In this way producer services create a certain type of social infrastructure that is afterwards impossible to detach from the urban environment system (Graham, Marvin 1996).

The recent development of producer services in urban areas has expanded their impact to wider urban economies. Due to their ability to generate "superprofits", producer services are now able to take over the competition for land, resources, and investments at the center of large urban areas (Hall 2000, p. 48). The consequences of this processes

might be both negative and positive, for example, locally oriented services can be overtaken by profit-oriented businesses targeted at producer service workers.

Another part of urban restructuring involves relocation of Research and Development centers of companies. Mainly the location of these units is determined by two factors: the availability of highly qualified staff and the vicinity of corporate headquarters and production units (Hall 2000). As production has been decentralized, research and development units tend to be subject to decentralization as well (Knox, Agnew 1994). Now the most suitable location for R&D centers seems to be a large urban area where corporate headquarters are situated, being close to universities and other research institutions or close to the production sites (Malecki 1997). The geography of research and development centers is of extremely high importance to the overall economic development of urban areas as they are places where products are modified and new technologies are created thus giving an impulse for a city to move forward (Healey, Ilbery 1990).

Research and development centers are closely connected with the formation of new industrial spaces that are now the features of new economic activities concerned with new technologies, virtual reality, bio-technologies, and many others. The locational implications for new industrial location are: an access to highly educated and functionally flexible labor force, good infrastructural and informational connection to corporate headquarters, a business environment that favors innovations and creativity, an ability to connect to local and international markets (Graham, Marvin 1996). The emergence of new industrial spaces within urban area's borders will start new economic mechanisms in inner-city locations and support areas that suffered from deindustrialization before.

The process of urban restructuring has triggered an emergence of knowledge economy within urban areas. As claimed by Dunning, the recent economic growth and success is more likely to be a consequence of production and deployment of knowledge rather than production of tangible commodities and goods (Dunning 2000). This has to do with the development of clusters and the measures taken by local authorities to foster innovative activities in knowledge-intensive economies, for example, in high-tech or creative industries such as biotechnology or design, cinematography. This way the proximity of firms and therefore interactions among them contributed to faster exchange of knowledge and knowledge spillovers (Gertler 2003). The knowledge economy became one of the reasons why economies of urban areas are now more inclined towards mobile and flexible forms (Wood, Roberts 2011).

Overall, due to the globalization of economy urban development has step by step exceeded administrative and regional restrictions with urban hierarchy being expanded in a new way. Globalization and the emergence of economy of knowledge and information culminated in the reform of the production mode, of technological and economic structures when the economy of urban areas has spread out from "within" to "among" (Alin 2015).

In this way cities become nodes of political decision-making, centers of trade and finance, educational and cultural mediators across the world thus transforming into networks which Sassen called to be "global cities" (Sassen 2002).

The look and functions of a city of the future still remain vague. However, the table below summarizes the contemplation of Cook about what post-modern cities would be like (Cooke 1990).

Modern Urban Area	Post-modern Urban Area
Structure	
Divided by functional zones with a dominating central business district, real estate price declines for more remote parts	Chaotic network structure with several functional centers, high-tech corridors and well-developed suburban areas
Architecture	
Architecture is determined by function	A mix of styles designed for specialist markets
Government and authority	
Managerial form – resources are redistributed for social needs, critical services are provided	Entrepreneurial form – cooperation of private and public sectors of economy, services are provided by market, investments are of extreme importance
Economy	
Characterized by mass production and economies of scale, mainly is production oriented	Globalized, focused on economies of scope, service based
Planning	
Space as a whole is generally planned for social ends	Space is fragmental and is planned for aesthetics
Culture and Society	
Society is divided by classes	Society is fragmented mainly by lifestyles

Table 1. Differences between modern and post-modern urban areas

The population of urban areas will change in the future as well. Richard Florida states that the best policy for urban areas in the context of globalized economy is to attract

representatives of the creative class that would encourage a city to be geared to a denser pattern of urban development (Florida 2010). Now the concept of creative city has become a subject of interest for economists, place- and policymakers due to the recent findings that cities integrate economic specialization, political and cultural values, and psychological traits in a way when psychological and non-psychological characteristics of cities complement each other (Andersson, Andersson, Mellander 2011). Creativity in economic terms is regarded to be a dynamic process that generates new ideas that are significant to developing of technology, institutions, and culture. The close links between creation, innovation and outspread of ideas may be a major reason for larger cities to be both historical and contemporary hubs of creativity. Florida describes a creative class as people whose job is to generate new forms – engineers, scientists, poets and writers, artists, researches and many others (Florida 2008). These are people that an urban area cannot choose but attract in order to be successful in a globalized economy. It can be done by promoting pleasure amenities like restaurants or thriving scenes of cultural life, natural beauty, outdoor facilities, general diversity and tolerance to various life styles (Murphy 2010).

Urban economist Edward Glaeser points out several directions of development for urban areas to be successful in the future of high global competitiveness. According to him, cities should a) attract smart educated people with a high level of human capital and make it possible for them to work in collaboration, b) allow high-rise construction and initiate a well-developed transit system, c) support public education and highly professional urban government with a transcendent infrastructure, d) define clearly and protect property rights, e) promote active immigration policy to achieve a diverse population (Glaeser 2011).

3.4 The concept of urban environment and its components: redefining an urban environment in a modern world

It has been always clear that a spatial environment and people are in a state of constant dynamic relationship. The nearest environment in which a person is active is the area of his or her residence: the city district, quarter, street, house, and yard. All the components of this logical series are interrelated, but have different effects on human activities, the formation of its economic, political, social, cultural and others connections.

Philosophical understanding of a city and its problems, of an urban environment and its categories requires appealing to the rich experience of the theoretical study of urban space. In many respects the urban environment shapes interpersonal relations, performing a sort of mediating role, as well as providing a significant impact on personal development, it defines space as a dynamic system of human (individual and group) relationships and communications which then can form economic, social and cultural connections. We can say that the city is a unique institute, due to the peculiarities which set of heterogeneous human communities enter into communication (Kovaleva 2014).

Various analyses of the ever changing socio-economic picture of the world lay more and more emphasis on the transformation of the territorial organizations and the ways a space can be possible used, mapped out and delimited. These transformations van be studied by paying attention to two major aspects which may seem to be different but yet are closely interrelated.

The first aspect dwells upon the connections between the current processes of redefinition of the notion of a "territory" and the alterations made by globalization processes, taking place not only in the economic and financial fields but also in such areas concerning spatial systems as institutional, governmental and social. Carlo Salone in his review illustrates these phenomena by the process of the European Integration. He points out that a process like this may often be accompanied by a loss of centrality as well as by the loss of sovereignty by a nation-state government (Salone 2013). The aspect addresses the idea that with a help of market values being a modern lingua franca globalization processes suggest new models of territorial organizations that in many cases are aimed at simplifying the existing diversity and at diminishing local territorial peculiarities to something of no importance.

Nevertheless, responding to the mentioned trends of globalization there are multiple differences arising between different places, showing that de-territorialization and selective re-territorialization are two parts of the same process (Storper 1997). Furthermore, economic globalization triggers rescaling processes – processes of "reorganizing, reconfiguring, and redefining the territorial scales involved in transformations and the related levels of government", at the same time changing the places and their political structure (Brenner 1999).

Carlo Salone makes it clear that globalization in the urban environment context results in the origin of "supra-" and "infra-national" level and forms of territorial organization which certainly affect the daily life of urban societies and in a way vivifies a role of territorial structures on a global arena (Salone 2013).

The second aspect concerns reconsiderations and adjustments in the forms and procedures of collective actions in urban and territorial policies – for example, the growing importance of partnership, institutional cooperation, and planning strategies. This side of territorialization alters a perception of a territory from a point of view of theoretical thinking on models of collective action and of proceedings for interference in both the city and the territory (Governa, Salone 2005). To a certain extent, in our opinion, this process imposes cohesion of two movements: a movement towards joint planning and a movement targeting territorializing collective action.

Overall, the concepts of "urban environment" and in particular of "urban system" seem to be undergoing a piecemeal but distinct redefinition. This redefinition is represented as a switch from understanding a concept of urban environment as a static and passive space to its comprehension as a dynamic and active context. Modern cities of

miscellaneous sizes, defined by administrative borders, now appear to be dynamic and active territorial domains, the shape and boundaries of which are set in a common action of the players operating in them. New emerging territories extend beyond the traditional conceptualization of cities fixed in time, space and functions (Bagnasco, Le Gales 2000).

In the current situation of constant changes comprehension of a role of the urban environment is fairly divergent. Often either positive or negative elements of it are paid attention to leaving no room for theoretical interpretation of the system as a whole. Nevertheless, one of the latest trends is recognition of new forms of territorial organization which underlines new forms and new ways of referencing the identity of cities (Amin 2002).

At the present moment it can be observed that a concept of urban environment is being re-introduced step by step in the context of urban planning and economic geography at the expense of "space", which for many years and mainly for quantitative reasons was a leading concept in research, but is less popular now due to the growing relevance of the actors' cooperation in appointing territorial demarcation as well as to the recognition of spatial power-related practices (Paasi 2008). This is the reason why certain vagueness remains.

A lot of researches propose a term "urban milieu" which is in its essence similar to urban environment (Lever 2013). The Oxford English dictionary defines it as "environment, state of life, social surroundings" (Oxford Learner's Dictionaries 2016). Therefore, an urban environment embraces a complex of contextual characteristics – locational, spatial, economic, political and social – which, in their turn, exert an influence on the economic development of a city. In more exact terms, as highlighted by Lever, the term environment in an urban context is usually regarded as being in a strong connection with a set of factors that would have a significant impact on the processes of emergence of economic clusters. These factors can also have an effect on the dynamics of economic growth. This is the reason for the observation that two entities, for example, a producer and a customer, can with a help of conducive environment improve the product or service offered and its use (Potts 2002). Another way to define the urban environment is in terms of the degree of structural economic specialization though the generation of clusters which would create possibilities for labor and networks which sustain economies of scale and encourage innovation (Glaseser 2011).

However, this definition of an urban environment can be broadened with wider paradigms which comprise a range of dimensions – spatial, economic, cultural, political, informational, and many others. Spatial environment of a city basically concerns the location in space of cities and economic establishments which is estimated by the costs of getting over the distance to other cities or to connected economic establishments (Lever 2013). This dimension of an urban environment lays the foundation for location theory and

the determination of optimal locations. Economic environment consists of a set of factors such as supply chains, markets, labor and capital suppliers and their prices.

The economic environment of a city includes a number of factors which explain or at least are connected to the phenomenon of the economic competitiveness of cities. This basic set of such factors should encompass such variables as the prices of capital, of labor, usually represented by wages, and of space in the form of the renting price. The economic environment, however, concerns with a wider range of issues than simple factor prices. As it was highlighted by Lever, scale economies at a level of urban environment have a tendency towards fostering the larger units. External economies, being an advantageous factor which resulted from the spatial clustering in a certain sector or a set of interconnected sectors like a particular group of services, for example, may make the comparative advantage of cluster clear and interpret Marshallian industrial districts. At the urban scale, agglomeration economies tend to be conductive to larger cities though their supply of particular infrastructure, variety of labor and product markets, a wide range of services and institutions (Storper 2010).

Cultural urban environment is usually viewed from two different perspectives. Some researches outline that cultural characteristics of a city provide a range of leisure, creative and artistic possibilities that improve a quality of life for its residents (Evans 2009). Others pay attention to the fact that cultural attributes encourage the economic growth of a city both due to attracting income through tourists and to connecting creative industries (Florida 2002). Also, cultural amenities of a city favor the creation of the creative class which could be seen as a long term investment in the social and human capital of a city. Such an investment seems to be of a particular importance as this class of creative people generates innovations in all the spheres of life which leads to the increase of a city's competitive advantage.

William Lever points out the significance of the informational part of the urban environment which deals with creation and maintenance of a base of knowledge. Earlier location theory was focused on the movement of physical goods such as raw materials or finished goods, for example. However, now flows of information appear to have more influence on the success of a city even though they are definitely more complicated to measure (Simmie 2001). Lever claims that absolute measures of the information possessed by a city are the number of patented innovations and the ways of their commercial use (Lever 2013). In our opinion, these factors can be expanded to include, for example, Research and Development indicators, the number of students in higher education institutions, the flow of information in the Internet, and organizing information – exchange events in a city like a trade fairs. Lever proposes to classify knowledge available in a city into two categories: tacit and codified knowledge (Lever 2013). Tacit knowledge is direct and specified, and usually is passed by face-to-face interactive means involving a high level of mutual trust and assuredness which affirms the competitive advantage of a city,

whereas codified knowledge is largely available in numerous sources of information causing its omnipresence to eliminate the geography of distance (Howells 2002).

The political environment of cities includes various constituents as well. First of all, public procurement may be a reason for positive influence of a public sector involvement in the urban economy (Lember, Kalvet, Kattel 2011). Furthermore, urban development and the encouragement of creation of new enterprises may be supported by the possibilities of local government and public authorities to set up a positive local environment which would work in favor of business development (McCann 2001). Additionally, incoming investments can be attracted by facilitating a legal framework which would provide contract enforcements and expedited legal procedures. There are also several examples when an economic direction of a city was set by the form of political leadership which can be a charismatic governor, for instance. Well-known illustrations of these processes are London, Barcelona, Paris, Lyon and Glasgow where economic development was enforced by urban place marketing and engaging of such important events as Olympic Games or Commonwealth Games, numerous festivals, carnivals, and fairs as well as by major improvements of infrastructure like speed rails or airport growth (Lever 2013).

Urban environment has in many ways proved to be of critical influence to the economic potential, development, and prosperity of cities and enterprises which could be an evidence to continue a deep studying of its nature.

3.5 The notion of a city: interpretations and its constituents

Generally, a city is a fundamental component of the overall economic life which becomes active, dynamic, and intensive only because of the economics interactions inside cities and between them. Nevertheless, despite the high importance of cities in economic, cultural and social life, so far there is no unified operational definition of a concept of a "city", which could be used in the field of urban planning and development. The concept of a "city" on the one hand is so widely used and seems to be so familiar and understandable, and on the other hand is so complex and multidimensional that practitioners use it without wondering about its contents, and theorists find it difficult to develop a general concept and cannot come to an agreement about its essence.

In our opinion, the definition of "city" should take into account that the city is inherently a subject to many sciences: political science, urban planning, economic theory, economic geography, sociology, urban studies, and many others. Therefore, we are proposing a new approach that would allow defining a city as a collection of corresponding spaces: physical, economic, social – all of which could be united in a public space.

3.5.1 Physical space of a city

The first thing that comes to mind when thinking about a city is obviously a location. An understanding of a city as of an object of economic geography and urban studies has a special prospect. Geography of the city is important at different territorial levels, so this approach seems to be the most profitable. This geography identifies the key

property of the city - urban concentration (Meteleva 2011). It is understood as the combination of various facilities and activities in the same area, as well as the associated population. The most important result is the diversity of urban concentration, which in turn acts as characteristic of the "real" city, giving rise to its versatility.

The concept of understanding a city as an object of economic geography in a sense is close to the concept of economic theory. To some extent, it combines the economic base and the scope of urban planning. A special feature of this approach is the inclusion of economic and statistical functions typology of criteria such as the economic situation of the city, geographical situation and content of its function. So the development of the city as a whole is to benefit from it economically and geographically by provision and management of urban development – it is the transformation of the features of such a provision in the benefits.

One of the main goals of the urban geography is to analyze the principles of city distributions as well as to look for socio-spatial resemblances or discrepancies that could be found between and within them. Despite the individuality of each city, urban geography proofs that there are various common laws that can be applied to all of them – the physical space of a city is usually composed by similar elements, for example, residential areas. The science researches such universe problems familiar to most of the modern cities as the ever increasing level of poverty, environmental pollution, inadequate housing. The science of urban geography is trying to look into these issues by studying interconnections of environmental, technological, economic, social, cultural and demographic forces that are particularly active in the urban landscape (Pacioni 2009).

The definition of a city in the context of the urban geography depends on the approaches used. The first approach corresponds to the "spatial distribution of cities and linkage between them" - thus, it focuses on systems of cities (Pacioni 2009). The second approach deals mainly with the internal framework of a city – therefore, a city as viewed as a separate system. In our work we are trying to follow the both principles of the urban geography, i.e. look at cities from a broad perspective and accumulate various branches of urban geography as well as from a spatial perspective.

According to urban geography, there are several major methods to understand what makes a place be a city. Michael Pacioni has proposed 4 elements that help to identify the degree of urbanism of a place (Pacioni 2009):

1) Population. As urban places usually are larger than rural ones, it should be possible to define the difference in terms of the population size. It is interesting that the transformation from a small village to a town varies over time and space. For example, in Sweden a settlement is considered to be urban when the number of its population exceeds 200 inhabitants while in the US appointing an urban status to a settlement requires no less than 2500 people and a village in Japan has to grow by 30000 people to be recognized as an urban area (Pacioni 2009, p. 20). In the Russian Federation to be an urban area a

settlement should get passed 12000 inhabitants (Not a village, not a town 2015). The diversity may be explained by social and historical traditions of the countries. A threshold of 200 people may be appropriate for Sweden taking into account the patterns of sparse distribution of settlements there while the dense population of Japan would exceed this number extremely fast.

2)   Economic base. In addition to population size figure of merit in many countries of the world it is necessary to comply with various economic criteria to apply for an urban status. For example, in India to be regarded as urban a settlement has to have more than 75% of adult male population involved in manufacturing or service-providing activities (Pacioni 2009, p. 20).

3)   Administrative role. The majority of urban areas in the world are defined according to the administrative framework and legislation of countries where they are situated. This may create certain difficulties as in practice legal definition of urban places may have nothing to do with its physical characteristics or an actual physical extent of an urban area thus, when, for example, a city exceeds its administrative borders it might be troublesome to adjust its fiscal policy.

4)   Functional criterion. The definition of urban areas may vary according to approach addressing the issue of functions of urban land that shows the real urban influence.

The definition of physical space of a city may also involve networks of connecting cities and enterprises. These networks can be measured by the degree of their interrelationships and associativity, and by related distances and linked time and costs (Lever2013). These factors though are more closely connected to the fundamental theories of location described in the first chapter of the diploma thesis.

There are several physical features of urban environment that were identified by K. Lynch and assumed to be common for the cumulative image of a city (Lynch 1960). These elements include paths, edges, districts, nodes, and landmarks. Paths are generally routes of how people mode around the city – it can be streets, roads, highways, railroads. For many people these are the dominating elements of their physical environment: as people perceive a city while travelling across it, other elements are organized in relation to paths. Edges are the linear elements of environment not regarded as transportation means. Usually the edges are borders separating one district from another and serve as an organizing element especially in cases when they are defining the shape of an urban area. Districts are viewed as medium-sized elements that often share common characteristics of shaping a city but the influence of districts is perceived individually. Nodes are defined as strategically important points of urban areas. Besides transportation nodes, there can be nodes presented as places of maximum concentration of functions. For example, centers of districts can be nodes as well. Landmarks usually serve as reference points – distant and

local. Generally landmarks include buildings, towers, and natural hallmarks of the area (Lynch 1960).
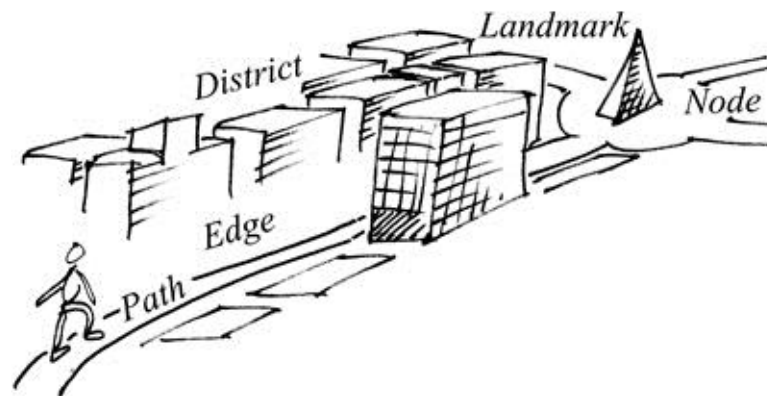
Picture 4. An illustration of Lynch's physical components (Lynch 1960)

It is necessary to mention that due to the globalization of economy and overall trends of cities growing global even physical space of an urban area is undergoing continuous changes. The physical environment of a contemporary city is a "series of transformations and situations" (Sepe 2013, p. xiv). The trend of differentiation in the elements that are responsible for the city organization has led to changing of physical space not much in the form but in affordances of embodying urban condition. Therefore, a modern city is often viewed as a "chaotic dispersion of things and subjects" and on a scale of physical space is characterized by a certain degree of fragmentation with frontiers that are on one hand invisible but on the other hand very difficult to cross (Sepe 2013, p. 79).

3.5.2 Economic space of the urban environment

Generally economic space of a city is defined in terms of costs and benefits of conducting a business there creating a production function by combining a range of factor costs (Lever 2013). Nevertheless, these costs can vary from one city to another: while interest rates (capital costs) tend to stay the same, labor costs can be divergent between and within cities unless they are regarded as integrated labor markets. Thus larger cities, consequently obtaining larger labor markets, have more opportunities appearing due to greater diversity and specialization. Prices for land and properties may as well differentiate between and within urban areas but generally they project the costs and benefits of conducting business at specific sites and can be eventually counterbalanced by high profits. However, as it was pointed out by Lever, for defining the economic space of an urban area it is much more important to assess the possibilities of access to external economics by firms and enterprises that are operating there (Lever 2013).

In the dimension of economic space these externalities can be divided into two major types: external economies and agglomeration economies (Lever 2013). External economies are characterized by abilities of factors to encourage clustering of firms and enterprises of one sector by interconnecting in terms of flows in manufacturing, or related

particularities like highly professional labor force specific to the industry, specialized infrastructure or provision of distinctive services (Lucas 2001). Agglomeration economies are characterized by attracting firms and enterprises from any industry by factors that are related to larger urban areas (Fujita, Thisse 2002). The examples of these factors may include the size of the conclusive demand, the variety of input suppliers and rivalry of prices, the flexibility of the labor market, a wide range of site and forms of properties, and the influence of local authorities (Rozenblat 2010). Previously it was assumed that urban areas expand in its territory due to the economic growth both within them and on the national level. However, more recent researches have proven that that the correlation between these processes remains vague as it is statistically hard to link the dynamics of GDP with the temps of urban growth (Polese 2005). There are several reasons for this. The first one is that urban areas are dynamic economic entities which are statistical units therefore applying statistical methodology towards them might be a difficult task. Secondly, the development and growth of urban areas is not determined solely by economic achievements and results, it is also a result of culture, social and human capital, values and trust that impact the urban nature (Landis, Zhang 1998).

Clearly, the growth of the cities at the end of 90's and at the begging of 00's could not be controlled, in a way it was self-sustainable but both chaotic. Lewis Mumford, a representative of the Frankfurt school of philosophy, came up with a special term – a megamachine – for the structures in which a position for the retention of the whole and a responsibility for the whole have been lost (Mumford 1967). The philosopher saw a direct relationship between a city's transition into the megamachine and its size. Human way of thinking was not able to comprehend the metropolis in its entirety and complexity so a loss of control took place. The result of city's transformation to a metropolis is a loss of control of economic factors as well. Growth of the city becomes spontaneous, there come more and more residents, the costs and prices go higher but not because of the quality growth but because of the congestion growth. At the same time the city ceases to perform its social and cultural functions which according to Lewis Mumford consist in transforming the surroundings and environment and in transmission of the culture (Mumford 1967).

As many researches claim the dependence of city growth on the increase of GDP, it is clear that this kind of relationship cannot be entirely linear. The expansion of borders of urban areas means not only positive advancements but a range of problems as well. Agglomeration diseconomies are reflected in traffic congestions, high demand and insufficient supply of services, administrative and legal complications and the ever rising prices for land and real estate. Moreover, the growth of urban areas provokes such social problems as the increase of crime and violence rates and great level of social pathologies. As a result of negative effects of city growth the rates of marginal costs and marginal benefits is considered to be U-shaped with the optimal size of a city which minimizes costs and maximizes revenue (Boddy, Parkinson 2004). Nevertheless, there exist another point of view that states that the impact of agglomerative diseconomies is overrated and therefore larger cities tend to be effectively better (Glaeser 2011).

Concerns about large cities economic environment has resulted into proposal of two global strategies for economic development – promotion of urban polycentrism and generation clusters of new industrial districts. The development of several urban centers is thought to be an effective way to achieve benefits of agglomeration without facing its diseconomies (Cowell 2010). There are already examples of successful application of such a policy – Ruhrgebeit in Germany or Randstad in the Netherlands. Sometimes, it is assumed that polycentricity can be associated by specialization of functions of urban centers.

The current research on clustering proposes that agglomerations can be defined as merging: a) a spatially concentrated and industrially specialized cluster of small and medium businesses, b) a strong stable cultural and social background that would connect economic agents and create a set of commonly recognized values, c) a network focused on market and non-market exchanges of goods and services, d) a strong community of public and private institutions that would provide support to economic agents in the cluster (Lever 2013).

A formula for successful operation of this type of environment is a possibility to adapt for the differentiated demands of customers and to be configurable with altering tastes, preferences, and technologies. Post-Fordist manufacturing forms like this can evolve in 3 types of spatial environments. Firstly, in Marshallian industrial districts which are presented as networks of enterprises connected by their functions where cooperation is based rather on ethic values that on competition. Then the favorable spatial environment may be formed by constellation of small and medium business around large corporations. Third type is shaped by clusters of local branches of multinational corporations which are usually associated with a low level of connection (Markusen 1996). Despite the fact that previously products, goods and services were thought to flow among firms and enterprises, now the emphasis is laid on the flow of ideas among and between clusters (van Heur 2009).

A research by Ake E. Andersson has stated that in the contemporary economy of cities a major driving force for its development is creative activities that provide possibilities for production of knowledge that will be actuated by culture and communication (Andersson 1985). This type of activities is considered to have a strong effect on production activities occurring within the economic space of a certain urban area.

In modern cities the resource base is no longer focused on natural resources or energy but on education and assets that illustrate creative activities (Karlsson 2011). According to Karlsson, the economic space of a city therefore consists beside changes of material infrastructure like transport systems and buildings, non-material infrastructure like knowledge base and knowledge linkages, and of institutions like behavioral rules or property rights (Karlsson 2011). In this way economic space is not plain but is presented in many interconnected layers.

According to Andersson, there are several basic principles for developing a modern economic milieu of a city (Andersson 1985):

1)   Propitious attitude towards experimenting,

2)   Flexible texture of knowledge and competencies,

3)   Flexible and preferably unregulated financial base for innovations as well as for cultural life,

4)   Easy access to personal interactions within the milieu,

5)   Inhomogeneity of social and physical environment,

6)   Belief that needs are more important than existing resources,

7)   Versatile social and economic organization of a city.

As a perception of economic space of a city as a place where to locate the business has developed, it has been noticed that there is a major shift of attention from factor costs and production functions to knowledge and social capitals, behavioral economic aspects and the importance of trust and culture.

3.5.3 Social and cultural spaces of a city

While the quantity of available to employee labor has been already described in a concept of human capital, the term social capital is relatively new to scientific circles. Partly explained as a level of social unity, social capital is generated by the development of networks encouraging trust, inclusion and reliance (Putnam 2000). This can be achieved through instigation of small area projects aimed at promoting partnership in the field of community development, through stimulating neighborhood-oriented activities with public and private agencies to improve social and economic life in targeted areas. The main principle of social capital formation is that poor communities demand social organization in order to achieve economic opportunities (Karlsson 2011). These communities cannot count only on external support in refreshing of their neighborhoods as private investors often find them unattractive or are merely uninformed about their economic potential and local authorities disregard the neighborhoods' needs. That is why a formation of social capital may be an answer for attracting investments to local economies and for the following employment.

The generation of social capital is also aimed at intensifying social networks that are marked by greater social cohesion. It is assumed that urban areas with greater social cohesion have wider prospect of development and bigger potential, especially in the context of occurrence of new industries (Karlsson 2011). A strong social capital and its assets usually contribute to the competitiveness of urban areas. However, as underlined by Potts, social networks can have a negative impact by excluding talents and innovations in order to prevent inner competition and create entry barriers to industries (Potts 2002).

The cultural space of an urban area is usually understood as more than social cohesion. Taking into consideration that competitiveness and growth of urban areas are partly determined by innovations that result into new products and services, a space that support innovations will be of extreme significance. The success of settlements has always been connected to innovations and the formation of strong base of knowledge that at times led to formation of successful industrial clusters. The prosperity and potential of an urban area in this case depend both on the entrance of new firms to various sectors of its economy and on innovations developed in already existing enterprises (Karlsson 2011). It is proven that technological advancements have an essential role in locational growth – that is why technological focus on supporting innovative industries is a central one for contemporary policy-makers.

Besides social capital and innovations being integral parts of an urban area, a concept of a "creative city" is now adding value to its cultural space. The studies started with the works by Landry who connected transformations in cultural industries to the revival of cities in the UK in 1980-s and 1990-s (Landry 2000). The major function of creativity in this context is to help solve everyday problems arising within urban areas while culture is considered to be an engine for stimulating economic development and supporting urban image. Before 1998 the concept of a creative city was viewed in a different way – namely from a perspective of the European Capital of Culture that concentrated on cultural activities and creative interventions as driving forces of urban regeneration (Comunian 2010). Later on the focus shifted towards the production of creative products and culture and the availability of professional labor force to lead in a knowledge-based creative economy. The shift is visible in occurrence of creative industries and creative class, the notions of which were specified in the diploma thesis before.

It is certain the culture has been one of the central elements for urban environment as it is firmly incorporated in its fabric. Even if before urban planners were most of the time concerned with the preservation of the already existing environment, now the relationships between people and places – their culture – is being underlined (Cuthbert 2006). According to Louis Mumford, culture bears extreme significance for understanding the relationship between people and an urban form (Mumford 1967). E. Hall identified culture as a way of communication (Hall 1976). Ch. Alexander states that a primal task of city planning is "the design of culture" as it "specifies certain roles, certain allowed limits of behavior…and the requisite spatial setting for this behavior" (Alexander 1974, p. 259).

One of the features of cultural space of an urban area is aesthetics of an urban form. There are several approaches to studying and evaluating urban aesthetics. It can be concerned both with the processes of perception, cognition and forming an attitude and with the research of aesthetic philosophies and processes of creation (Cuthbert 2006). It may be therefore concluded that cities' aesthetics rely on not only the pleasurable sensory experiences, enjoyable perceptual structures and amiable symbolic associations but also on semantic and semiotic content of an urban form.

Picture 5.New urban forms as an expression of urban aesthetics (Urban style 2016)

One of the major concerns of cultural researches in the field of economy is the extent to which a spatial organization of manufacturing of cultural products differs from traditional production as well as the extent to which a consumption of cultural products and operation of cultural markets are different from the conventional ones (Cuthbert 2006). Therefore the cultural space of an urban area is shaped by provision such material levels of cultural functions as cultural centers, galleries, theatres, museums, theme parks, restaurants, hotels, airport, etc. which are aimed at accommodating an abundance of activities. Urban cultural space represents symbolic capital in its multiplicity: national and local identity, public and private interests, popular and high culture, collective memory, history and ambitions.

3.6 Public space as an element of urban environment

To understand the nature of a public space it seems to be necessary to understand first what a public realm of an urban environment is. A public realm is usually defined as a location and surroundings of a public life and is meant to function as a site of political processes, social interactions, communication and exchange of information (Loukaitou – Sideris and Banerjee, 1998). As a site for political actions a public realm should encourage inhabitants to discuss, debate, deliberate and resolve arising issues (Arendt 1958). According to Habermas, a public realm should address public affairs (Habermas 1989). He based his ideas on the assumption that development of spaces like coffee houses or cafes as well as media sources would improve the forms of argumentation. More recent approaches consider a public realm to be a set of distinct yet intersecting spheres uniting various social, economic, gender and ethnic groups (Featherstone, Lash 1999).

Generally a public realm can be divided into two broad categories: physical and sociocultural. Therefore, a public realm includes all the spaces that are available for the use of public (Carmona 2010):

1)	*External public space* is thought to be an impeccable example of a public space. In urban environment it consists of objects situated between private properties like public squares, parks, streets, highways and roads.

2)	*Internal public space* implies belongingness to a public institution such as libraries, offices, administrative buildings, museums along with the means of public transportation and facilities related to them, for example, a bus stop.

3)	*External and internal quasi-public space* is legally private places which are nevertheless accessible to public. These places are public only nominally as legal owners can adjust their availability and regulate the behavior there. These characteristics can be seen in universities, restaurants, cinemas, shopping malls and many other institutions.

Provided that external, internal and quasi-public spaces are often hard to draw a line between, it could be recommended for city planners to focus not only on physical characteristics of a public space but rather on broader perception of a public life – e.g. sociocultural dimension of public relations and activities between people (Banerjee 2001). Public life is assumed to be active in private places as well – in small businesses like coffee shops, bookstores, and other third places.

Public life can find its expression in formal and informal ways. For city planners informal public life is of greater importance as it occurs out of formal institutions and directly depends on people's choices – people are constantly choosing which environment they prefer to use. Understanding the patterns of this decision-making processes will allow to plan certain economic, social and cultural activities by offering a related space.

According to everything mentioned about, it is clear that a public space is an integral element of a public realm. The scale of understanding what exactly can be referred to as to a public space is infinitely wide: from the small scale of physical objects like streets, squares and parks to neighborhoods, cities and countries along with media, Internet and Intranet, and even local, national and international authorities (Low, Smith 2006). Urban designers, architects and planners prefer to stay focused on physical features of public spaces as their task is usually to make people engage in a relationship with a space; urban sociologies tend to link public spaces with social dynamics; political researches are paying attention to human rights; urban economists are concerned with various location theories (Mehta 2013). Taking into account economic, social, and cultural nature of a public space, in this diploma thesis we would prefer view public spaces as a physical expression of a public realm which is though essential for its sustainability.

There are several definitions of a public space concerning the matters of property, ownership, control, access, its use and its functions. One of the general definitions is that it is a place not controlled privately and therefore is open for general public (Madanipour 1996). Carr put an emphasis on the fact that a public space is a destination where people long to engage into individual or group activities (Carr 1992). In our diploma thesis we

would like to focus on the issues of access and use of a public space rather than on the form of its ownership.

It also seems to be necessary to separate public space from non-privatized properties that might be parts of neighborhoods and be situated close to homes and therefore classified as parochial (Sampson, Raudenbush 1999). Interactions and all types of activities may be happening in parochial space too; however this paper is referring to public spaces that initiate public use and active or passive social behavior. In such a manner in this diploma thesis we will define a public space as a place accessible to general public, initiating public use, promoting economic, social and cultural activities where people are subjected to general norms and regulations of an urban public space use.

Public spaces are regarded by us as an element of urban environment that unites its other spatial dimensions mentioned before as historically public spaces were the sites of political, religious, commercial, social and civic activities. At present some of their functions were relocated to private or virtual field (Banerjee 2001). Nevertheless, residents of large urban areas and mixed-use territories still rely on successful operation of public spaces in their primal function – when they are used for meeting, shopping, travelling, interacting, and having leisure activities. Public spaces continue to play a key role as platforms of opportunities for individuals and communities to develop and "enrich their lives" (Thomas 1991, p. 222). In his research, Thomas identified four specific roles of a public space: a) a platform for a public life, b) a gathering place for various social groups, c) a platform for exchange, and d) a communication system between urban activities (Thomas 1991).

Recently there has been a revival of interest in researching urban places caused by the active urban restructuring discussed in previous chapters. Residents of large urban areas are looking for amenities situated closed by and providing access to such activities like shopping, entertaining, employment – the majority of which are basic functions of public spaces. The renewed interest includes also purposes of commerce, social interaction and promotion of local identity (Cooper-Marcus, Francis 1998).

The heart of every city is innovation. We believe that placemaking and public spaces development may be the innovation needed in the various cities of Russia, including Krasnodar and some of the cities of Czech Republic. Generally, a public space may be a gathering spot or part of a neighborhood, downtown, special district, waterfront or other area within the public realm that helps promote social interaction and a sense of community. Possible examples may include such spaces as plazas, town squares, parks, marketplaces, public commons and malls, public greens, piers, special areas within convention centers or grounds, sites within public buildings, lobbies, concourses, or public spaces within private buildings (Zwijger 2014). Great public spaces are where celebrations are held, social and economic exchanges take place, friends run into each other, and cultures mix. Not only do public spaces generate a comfortable urban environment, making

the city attractive both to the residents and to the tourists but they also create a feeling of belongingness, affinity, and desire to invest and contribute. When the spaces work well, they serve as a stage for public lives.

Picture 6. An example of a public place in Krasnodar (Fountain complex to open at Krasnodar Avrora 2016)

In evaluating thousands of public spaces around the world, Project for Public Spaces has found that successful ones have four key qualities (What Makes a Successful Place, 2015):

-        They are accessible;

-        People are engaged in activities there;

-        The space is comfortable and has a good image;

-        Finally, it is a sociable place: one where people meet each other and take people when they come to visit.

Such projects allow to see an organization of the public spaces in a new light and to simulate new creative and modern spaces, comfortable and attractive to residents. Moreover, public space as a factor of economic growth of cities, improvement of the quality of life and renewal of urban environment in the last decade have become the focus of professional discussions worldwide.

4 Practical Part

4.1 Linking place making and real estate development

Urban planning, and namely urban design, among other things face two major challenges – recognizing what generates a positive urban environment and what amounts for better places. In practice these challenges involve creating better places at a given site which typically means close interaction with real estate development processes. In this context urban planning has been divided into first order activities and second order activities which are closely connected in terms of the diploma thesis. First order activities imply the direct creation of urban environment and its components such as buildings, public spaces, or urban events. Second order activities by designing strategies, policies and frameworks create a platform for successful operation of actors of urban development which include among others a real estate market (Tiesdell, Adams 2011).

Real estate development process in basic terms is a process of creating a built environment (Tiesdell, Adams 2011). Being shaped both by a governmental policy and a local market, real estate development process should be focused on many factors to operate successfully like the degree of the involved risk and driving forces, the interests and constraints of the involved actors – developers, landowners, investors, planners and policy makers.

As it was pointed out by Tiesdell and Adams, real estate development process is extremely volatile and periodic (Tiesdell, Adams 2011). Recently there was the transition from the orientation to primal factors like the quality of the product, the time of its delivery and other characteristic to understanding the importance of location (Tiesdell, Adams 2010). Another trend is an abridgement of division between public and private sector development – less and less projects are focusing on development with entirely private sector therefore real estate development is directed at co-production between public and private sectors.

The role of local authorities in real estate development processes continue changing as well with state still remaining one of the active actors of the market. The research of Gore and Henneberry has shown that state-market relations are adjusting from the entirely economic nature to the social and cultural issues which indicates that real estate development combines both economic and social functions (Guy, Henneberry 2000). Therefore, real estate is a function of economic and social links for given time and space to which a range of key actors is involved – builders, construction companies, consumers, landowners, investors, economists, etc. Actors therefore become engaged in development by trying to achieve their individual goals and factors of motivation proposed in the following table.

Actors	Timescale	Financial Strategy	Functionality
Landowner	Temporary	Profit maximization	No
Developers	Temporary	Profit maximization	Yes if connected financially
Funder	Temporary	Profit maximization	No
Constructing company	Temporary	Profit maximization	No
First advisor (e.g. managerial agent)	Continuous	Profit maximization	Yes
Second Advisor (e.g. designer)	Temporary	Profit maximization	Yes
Investors	Continuous	Profit maximization	Yes if connected financially
Residents	Continuous	Cost minimization	Yes
Adjacent landowners	Continuous	Advocate property values	No
Local community	Continuous	Neutral	Yes if the dwelling is open to general public
Public sector	Continuous	Neutral	Yes

Table 2. Actors of real estate development and their motivation

The nature of development means that these motives of main actors are closely linked, when each actors is trading-off between objectives inwardly and among themselves. It should be noted that the mentioned actors have different strengths and weaknesses, different influence, and quality or better place making can be perceived by various actors in a totally different way. For example, the table illustrates the mismatch between the motives of supply-actors and demand-actors. Supply actors are mainly driven by short-term, financial and economic objectives as they tend to look at real estate as at financial commodity. Demand-actors in their turn have a long-term perspective and perceive a real estate as an environment to be used.

Closing these gaps seems to be an essential condition for a development of a good place. While responding to requests by investors and future residents, developers can neglect the needs of general public. Detached housing estates, closed communities and

other types of inward-focused developments can satisfy the needs and wants of their consumers but at the say time may contribute little to the public environment in general. Filling these gaps will boost the real estate development both economically and socially and contribute to the better places creation.

To do so it is important for the real estate development actors to overcome constraints connected to their opportunity space. These constraints might have three contexts: a) site context, b) regulatory context, and c) market context (Tiesdell, Adams 2004). A site context has to do with the physical environment and the smaller the opportunity space for developers is the more difficult and troublesome the site context is. Regulatory context is problematic as well, however the bigger the opportunity space is the less demanding it is. The market context affects the development opportunity space by competitive powers – the bigger the completion is the smaller the opportunity space gets.

Another point is for real estate development is the demand for urban location. There are a number of possible causes for this. Firstly, firms and enterprises would like to locate their offices in proximity to other firms and enterprises due to returns to agglomeration, low transportation costs for goods and services between them, knowledge spillovers mentioned in the previous chapters, or due to possibilities to reach a highly professional labor force that constellate around a variety of employers. Households may want to reside next to other households because of the social reason like constant access to interaction, or because it firms providing goods and services at the local level require a large number of residents to make it profitable (Sinai 2010). Once these amenities, including the ones provided by local authorities, are in place, the location would be more valuable to the marginal household.

As Todd Sinai states, it is obvious that in case when a specific location provide certain benefits (which is definitely a case of public spaces), the price of the land may capitalize the value (Sinai 2010). Therefore demand for such places can be illustrated in following ways – by higher prices for land rent or land acquisition or by increased supply. Depending on how much advantages a place provides, the land and property prices incorporate a certain percent of their value which is also determined by the elasticity of supply of land that is replaceable for that specific location. If land supply is highly elastic, there will be little of an advantage to be presented in the land rent provided that property prices are higher than the costs of construction. On the opposite, if land supply is not elastic, an urban area will have no opportunity to grow as developers would not be able to make projects concerning construction and the advantages of location would be capitalized into land rents (Glaseser 2011).

The differences between elasticity of supply in various parts of an urban area may also be a reason for real estate prices varying across the city. One of the factors may be the topography of an area. It seems to be obvious that it would be more demanding and expensive to construct anything in swampy areas or areas with high concentration of

ground waters which results in a lower elasticity of supply. Moreover, construction costs can also depend on a part of the urban area. Although geographic constraint will not change over time, the degree of how binding they are may alter significantly. For example, it can be expensive or unattractive to develop the remaining land which would lead to a less elastic supply of it. Also urban areas' governmental policies on land use can become more strict bringing new limits and regulations for new constructions.

The real estate prices may also reflect economic benefits of public places as engines of economic development generally. The return on investment of a place can occur at many levels. In the high-profile case of Chicago's Millennium Park, the city's $500 million investment is projected to generate $2.6 billion in visitor spending and add $1.4 billion in value to the adjacent real estate by 2014, ten years after the park's completion (Novara 2013). These models of successful places development provide real economic benefits to their environment via higher real estate values, higher occupancy rates, increased tourism, and in increased level of employment.

The development of urban areas is closely linked with real estate development in terms of urban strategic planning. Positive planning at urban level will not only save resources and reduce risks, but also provide benefits like uplift of land values, infrastructure upgrading, and improvement of a public realm. If planned holistically and paying equal attention to economic, social, environmental and other factors, public spaces are able not only to change an urban image but also attract new sources of wealth creation. Gary Hack and Lynne Sagalyn state that public places development may be referred to as a strategy for value creation through urban design (Hack, Sagalyn 2011). There are a plenty of illustrations of the value of open spaces as an amenity. For example, apartments facing a park usually are valued 20% more than the same apartments at the other side without a park view of the same building (Hack, Sagalyn 2011, p. 274). Researches in Turkey have stated that the value of a unit increases by 20-33% if there is a green space present on a housing site (Altunkasa, Uslu 2004). In Finland the amount of sales of apartments being adjacent to a public place is measured to be 7% higher than of those 500 meters away (Tyrvainen, Miettinen 2000). Even a small public place can make a large difference. The impact of public places on real estate development besides other means can be estimated with the help of hedonic price methods.

4.2 The impact of public places on real estate prices in Krasnodar

4.2.1 The city of Krasnodar: Introduction

The city of Krasnodar is situated in the Krasnodar Krai, the southernmost region of Russia which prides itself in unique geographical location, subtropical climate and a base of its natural resources that includes oil, gas, minerals, drinking water reserves, rock salt, iron, 3.9 million hectares of black soil and 18 resort and recreational areas with more than 1000 kilometers of beaches. The territory of the region is 76.000 of square kilometers and is bounded by two seas – The Black Sea and the Azov Sea. The Krasnodar Krai has 4

airports, 9 seaports, 2216 kilometers of railroads, and 8992 kilometers of motorways (Krasnodar Krai Presentation 2016).

The economy of the Krasnodar Region is characterized by the developed manufacturing industry and immensely diversified agricultural sector. The region's investment attractiveness is rationalized by steady economic growth and its promising opportunities for successful operation in such industries as food processing, engineering, consumer goods and construction. Currently the region holds a leading position in terms of tourist facilities and leisure industry casting itself as a year-round resort destination of international standards (Guide to investment: Krasnodar Region 2016).

An increasing number of Russian and international investors has been drawn to the Krasnodar Krai by a stable growth of economic indicators and its attractive investment policies. It is worth mentioning that Russian and International rating agencies have been giving high rankings to the region's high interest in investments now for several years in a raw, making the Krasnodar Krai a leader in what concerns favorable conditions of doing business (Guide to investment: Krasnodar Region 2016).

The city of Krasnodar is an administrative, financial, and cultural center of the Krasnodar Krai. The history of the city dates back to 1792 when after the victory in Russo-Turkish war the land was giving by Catherine the Great to the descendants of Zaporozhian Cossacks. What now looks like a modern and developed city at that time was just an army camp which later grew into a fortress named Yekaterinodar. The first planning of the territory was proposed in June, 1794, indicating its future streets and districts (The History of the City 2016).

In the beginning of the eighteenth century the city started constructing the first schools, churches, higher professional institutions which were mainly aimed at the activities for Cossack population such as military arts for men and nursing for women. At that time Yekaterinodar became a home for four annual fairs, and in 1842 The Trade Society of the Black Sea Cossack Army was established which besides the opening of the Railway station and the start of shipping in the Kuban River boosted the development of city's trade (The History of the City 2016).

During the Second World War the city was occupied by the German army and damaged so significantly that most of it was rebuilt after the war which changed its original look and original planning perspectives. Now the territory of the municipal formation is 841.4 square kilometers with the city being separated into four urban districts – West, Central, Karasunsky and Prikubansky. The municipal formation of Krasnodar also includes 5 village districts and 29 villages (The History of the City 2016).

Being the hugest transportation hub of the region, an important industrial center with 127 manufacturing enterprises, and an advanced agricultural core with 943 farm enterprises, Krasnodar is the leading city in attracting investments in the Southern Federal

District of the Russian Federation. Several times Krasnodar took first places in ratings of "best cities of live in" and "best cities for business". In 2011 Krasnodar was also included in the list of European cities with the most favorable conditions for the international real estate market (The History of the City 2016).

Therefore, Krasnodar can be considered to be the core of the region being a multifunctional city which can be characterized by diversified economy, a great share of science-intensive production, high sociocultural, technological and intellectual potentials, unique and complex functions of international levels.

4.2.2 Real estate and construction development of Krasnodar

Construction plays a significant role in the development of the economy by creation of new facilities, reconstruction of existing buildings, and renovation of premises. Indicators of volume and the pace of construction largely characterize the development of the economy as a whole, its economic activities, and the level and quality of life.

The construction sector of the Krasnodar region is a rapidly growing regional market, sustainable development of which involves a number of aspects: a) a high level of investment attractiveness of the region, b) the development of the regional economy, c) population growth, d) a rise in births (Usova, Kantemirova, Shcherbina 2015).

The construction sector in the Krasnodar region is the largest in the Russian Federation. According to the Ministry of Regional Development the Krasnodar region in terms of socio-economic development is related to a group of 17 subjects with a level "above average" (The results of socio-economic development of the region 2013).

The construction complex of the region has more than 200 major contracting companies, 60 large and medium enterprises of construction industry and construction materials industry, 20 leading design organizations and more than 5000 business structures, with the number of people employed in it corresponding to 1/12 of the total working population (Construction Department: To investors 2016).

Over the past few years, the region has risen in a number of key indicators related to construction works, attracted foreign investments, foreign trade, income level, etc. In 2013 12200 residential and 57 non-residential buildings (2 industrial, 11 commercial, 11 educational, health 5 and 25 others) were set on operation (The results of socio-economic development of the region 2013). It is also worth mentioning that 3509.5 thousand square meters of residential property were built that was by 31.4% more than in the previous year. According to the preliminary forecasts of the main indicators of the construction of the Krasnodar Region until 2017 housing properties will increase continually (from 3948.7 thousand square meters of total area up to 4300 thousand square meters of total area) (Construction Department: To investors 2016).

Housing and construction sector in the Krasnodar region represents, on one hand, the economic sector including residential real estate market but, on the other hand, the

direction of social policy, elements of which involve the implementation of projects of national priority - "Affordable and Comfortable Housing for Russian Citizens", "A house for a Russian family", "The dwelling".

As of August 2015 the total living space of buildings under construction in the city of Krasnodar was 4801512 square meters, with the total number of apartments being 96292 units. The activity of developers in the city is characterized as quite high: the volume of new housing in the calculation for 1 person from permanent population is 5.4 square meters. This figure is much higher than the average recorded in other large cities of Russia. For comparison, in Vladivostok it is 1.4 square meters of new residential properties per inhabitant, in Rostov-on-Don the figure is 1 square meter per person, in Volgograd it is 0.7 square meters (Real estate market indexes: city statistics, 2016).

In the period from 2006 to 2015, the volume of individual housing being built in Krasnodar increased by 3.5 times. The increase in volumes of erected residential properties is a direct consequence of the growth of real estate development activity in respect of the construction and implementation of new projects. In addition to the already operating market players actively constructing new objects, the primary real estate market in Krasnodar is welcoming new companies with large projects.

The structure of the primary market for individual housing in construction in Krasnodar is dominated by objects of economy and middle classes. Today they account for 87.8% of the total housing being built. However, the share of economy-class residential properties is gradually reducing and at the beginning of 2015 amounted to 32.4% of total supply in the real estate market in Krasnodar. An indicator of housing being built in the middle class segment has continued to grow and reached 55.4% of the total number of objects under construction at the moment in the city of Krasnodar. Segments of the business and the elite class are less popular among developers. (Real estate market indexes: city statistics, 2016)

The most liquid objects in the structure of Krasnodar real estate market are one-bedroom apartments. Their share in the primary market is 63.6% of the total supply. One-bedroom apartments occupy 28.7% of the total number of new housing. It should be noted that one- and two-bedroom apartments prevail in architectural composition of objects of economy and middle class. The largest share of spacious three- or more bedroom apartments is planned in the fixed business class facilities (16% of total supply) (Real estate market indexes: city statistics, 2016).

4.2.3 Specifications of the model
4.2.3.1 Data specifications

The database for the model for the city of Krasnodar includes 210 observations of real estate residential properties being on sale from September, 2015. The aim of data collection for the analysis of impact of proximity to public spaces was to include the

relatively equal number of observations for every urban district of Krasnodar. Overall, the model incorporates 50 observations for Central, Prikubansky and Karasunsky districts of the city and 60 observations for the Western district (see Appendix 1).
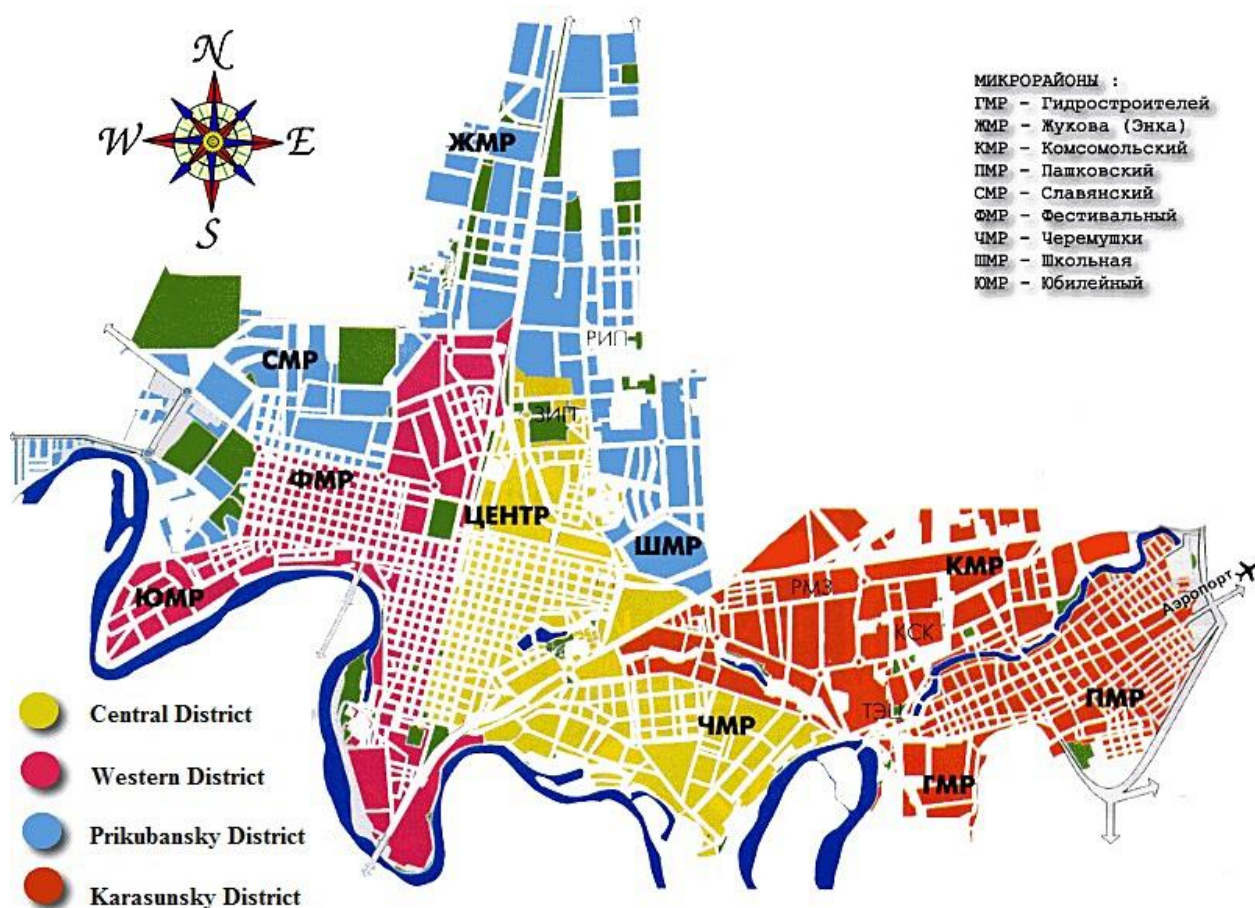
Picture 7. The map of Krasnodar urban districts borders (Krasnodar: map of the districts 2016)

As the administrative unit of the municipality the Western district was formed on June 12, 1936. The territory of the Western district is 22 square kilometers, or 4% of the whole territory of the city. Compared to other districts, the Western one is located at the smallest area, although in the central part of Krasnodar. The population of the district as on December 1, 2015 is approximately 180 thousand people. In the Western district there are 201 streets, including 32 main thoroughfares, 4 public gardens, 2 boulevards and 4 squares. District's Housing Fund has more than 12 thousand houses, 1411 of which are apartment houses (1135 are higher than 2 floors) (Administration of urban districts of Krasnodar, 2016). According to our estimations, the average price of a square meter in an apartment building in the Western district is 66348.29 rubles.

Administration of Karasunskyintracity district of Krasnodar is the territorial body of the municipal entity of Krasnodar City that covers an area of 152 square kilometers. At present there are 486 streets and alleys located in the district which is home to 239340

people. This figure greatly exceeds the number of inhabitants of many cities in the Krasnodar Krai. The district is formed by and operates a system of territorial public self-government. It includes houses and street committees, meeting in the community, and gatherings of citizens. There are 718house committees, 52 condominiums, and 79 chairmen of district committees who coordinate the work in the neighborhoods with 8 public centers (Administration of urban districts of Krasnodar, 2016). According to calculations, the average price of a square meter in an apartment building in the Karasunsky district is 50690.2 rubles.

Prikubansky district was established by the Decree of the Presidium № 419 "On Education Prikubansky district in the city of Krasnodar" on April 5, 1978. Today Prikubanskyintracity district has the largest territory of all districts of the city of Krasnodar - 474 square kilometers. District is represented in almost all branches of industry: manufacturing, construction and transport sectors, the leading position is allotted to the agricultural sector. The district is actively involved in the implementation of the concept of mass reconstruction and development. Plans for new residential areas include the mandatory presence of social and cultural infrastructure with convenient transportation. Today the population of the city of Krasnodar Prikubansky intra-district exceeds 260 thousand people. Every year, this figure increases by attracting businesses and promising young professionals, housing and natural population growth (Administration of urban districts of Krasnodar, 2016). The average price of a square meter in the Prikubansky district is estimated to be 50677.77 rubles.

Today, the Central district area covers 28.5 square kilometers. Among intracity districts it is the smallest territory, but it has the highest density of infrastructure, which is home to more than 154 thousand inhabitants. Central district largely determines the face of the whole city. 7 main transport arteries are located in the Central district. The development of national-cultural values, physical education and sports, assistance and support for the disabled and veterans, charity, and the solution of social problems in the Central District are allocated to 8 regional centers of work with associations and community policing, 9 county-governmental organizations, 7 Cossack associations and 280 territorial self-government bodies (Administration of urban districts of Krasnodar, 2016). According to calculations, the average price of a square meter in the Central district is 67824.34 rubles.

The sources for data of real estate market transaction were could be viewed in Appendix 1 for every observation. The average prices for a square meter in every district of Krasnodar can be seen in the following graph:

A price per square meter, 2015-2016, rubles

Legend: Western District, Karasunsky District, Prikubansky District, Central District
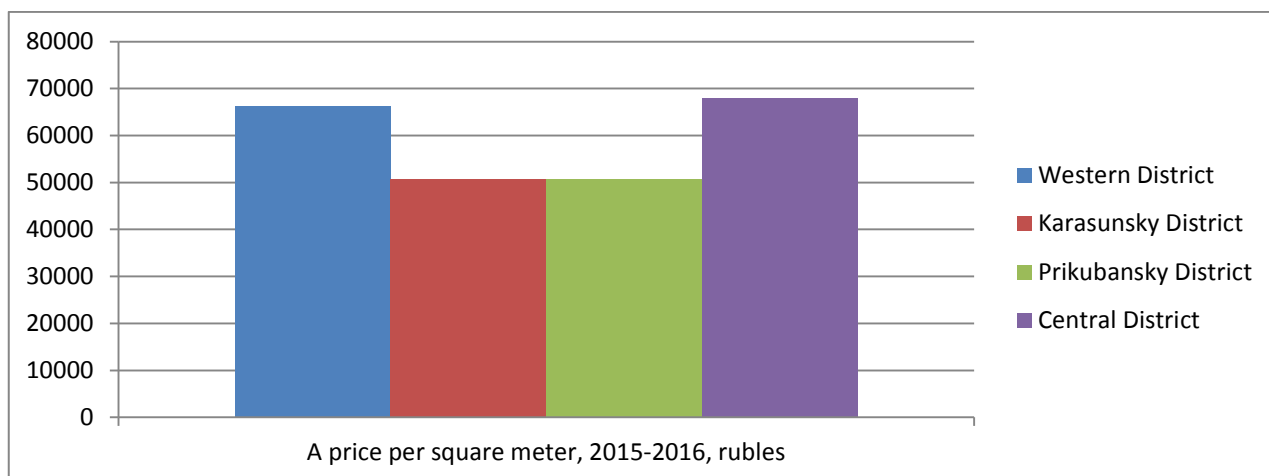
Picture 8. The comparison of prices for 1 square meter of residential properties in city districts of Krasnodar for 2015-2016, rubles

4.2.3.2 Variables specification

To make the model comparable it was decided to introduce 1 dependent variable and 7 independent variables: 4 variables characterizing the physical features of a dwelling and 3 variables displaying it spatial relations. It has been decided to choose these variables exactly as they were present in all the data sources in a unified form.

The variables applied include:

1)   The price for a square meter as a dependent variable;

2)   The size of an apartment;

3)   The number of rooms;

4)   The floor of a real estate property;

5)   The age of a dwelling;

6)   The distance to the city center;

7)   The distance to the nearest public space;

8)   The distance to the nearest stop of a public transport.

Considering the age parameter, it has been decided that a dwelling is thought to be old if it was constructed before 2014 and therefore valued as 0 and is thought to be new if it was constructed after 2016 and hence is valued 1.

In case of Krasnodar, the city center indicator is considered to be the main square of the city – the Theatre Square that is why the sixth variable is the distance from a residential property to the Theatre Square. The Theatre Square (formerly the October Revolution

Square) is located in the heart Krasnodar near the building of Krasnodar Academic Drama Theater named after Gorky and the Administration of Krasnodar. In the center of the square there is the plane "singing" fountain with 600 light fixtures.

By the nearest public space we understand the closet locations of public activities which as indicated in previous chapters are physical spaces of a city. For the model construction we calculate the distance from a residential property to an external public place.

The final variable is the distance between an internal public space such as a public transport stop and an observed residential property.

4.2.4 Construction of the model

To evaluate the influence of the proximity to public places on the real estate prices the hedonic price model was designed. Using the tools of the Statistica program, the correlation matrix was constructed.

	Price per square meter	Size of a lot	Number of rooms	Floor	Age	Distance to Center	Distance to Place	Distance to Stop
Price per square meter	1,00							
Sizeof a lot	0,09	1,00						
Numberofrooms	0,09	0,70	1,00					
Floor	0,08	0,16	-0,12	1,00				
Age	0,02	0,14	-0,11	0,40	1,00			
DistancetoCenter	-0,52	0,01	-0,13	-0,09	0,07	1,00		
DistancetoPlace	-0,46	0,04	-0,03	-0,17	0,09	0,64	1,00	
DistancetoStop	-0,29	0,02	-0,08	0,05	0,07	0,46	0,32	1,00

Table 3. Correlation matrix for the Krasnodar model factors

If correlation coefficients in the matrix are negative, it means an opposite dependence of variable: the higher the value of one variable is, the lower the value of another gets. Therefore, we can see that, for example, the further an apartment is from the city center, the smaller its prices gets.

To support the data from the correlation matrix, covariation matrix was constructed.

Covariances (Krasnodar)								
Variable	Size	Rooms	Floor	Age	City Center	Nearest place	Stop	Price per meter
Size	935,16	20,068	24,481	2,1754	1,2	2,0	0,20	48628
Rooms	20,07	0,880	-0,571	-0,0508	-0,4	-0,0	-0,03	1376
Floor	24,48	-0,571	24,596	0,9771	-1,6	-1,4	0,08	6804
Age	2,18	-0,051	0,977	0,2476	0,1	0,1	0,01	129
City Center	1,20	-0,407	-1,593	0,1123	11,7	3,6	0,54	-30833
Nearest place	1,95	-0,045	-1,370	0,0701	3,6	2,7	0,18	-12936
Stop	0,20	-0,025	0,079	0,0123	0,5	0,2	0,12	-1745
Price per meter	48628,09	1376,107	6804,252	129,1207	-30832,9	-12935,7	-1744,50	296990387

Table 4. Covariation matrix for the Krasnodar model factors

According to the selected factors, multiple regression analysis was conducted. During the analysis 210 cases were processes and 209 valid cases were selected. The results of the analysis are summarized in the table below.

	Regression Summary for Dependent Variable: Price per meter (Krasnodar) R= ,56438698 R?= ,31853266 Adjusted R?= ,29479997 F(7,201)=13,422 p<,00000 Std.Error of estimate: 14472,							
	Beta	Std.Err. of Beta	B	Std.Err. of B	t(201)	p-level
N=209						
Intercept			70600,23	3502,809	20,15532	0,000000
Size	0,175413	0,090194	98,85	50,828	1,94485	0,053188
Rooms	-0,097432	0,090349	-1790,12	1659,998	-1,07839	0,282153
Floor	-0,047406	0,068383	-164,73	237,619	-0,69325	0,488954
Age	0,045972	0,065511	1592,14	2268,823	0,70175	0,483650
City Center	-0,377246	0,082128	-1898,00	413,204	-4,59337	0,000008
Nearest place	-0,215397	0,077351	-2251,85	808,658	-2,78468	0,005870
Stop	-0,063449	0,065973	-3165,79	3291,754	-0,96173	0,337340

Table 5. The results of the regression analysis for the city of Krasnodar

Therefore, the final equation will be:

Price= 70600.23 + 98.85xS -1790.12xR − 164.73xF + 1592.14xA − 1898xC − 2551.85xN − 3165.79xT

(2)

Where:

- S is the size of a lot;
- R is the number of rooms;
- F is the floor of the apartment;
- A is the indicator whether the lot is new or old;
- C is the distance to the city center;
- N is the distance to the nearest public space;
- T is the distance to the nearest public transport stop.

The results of the model can be seen in the following table.

Equation	t-test
	for S = 1.94485
	for R = -1.07839
	for F = -0.69325
	for A = 0.70175
	for C = -4.59337
	for N = - 2.78468
	for T = - 0.96173
	= 70600.23 + 98.85xS -1790.12xR − 164.73xF + 1592.14xA − 1898xC − 2551.85xN − 3165.79xT
R	0.31853266
F	13.422

Table 6. The summary of the model for the city of Krasnodar

The quality of the model is medium as quality goodness equals 0.31853266. It can be explained first of all by the small number of variables chosen. As mentioned before, it has been decided to focus on physical characteristics of an apartment in comparison to its spatial relations. Such variables as the size of a lot, the number of rooms, the floor where an apartment is situated and the age of a building were chosen as they were accessible at all the platforms used for data collection therefore all the cases were treated equally. In practice, the price of a square meter definitely depends on other factors as well, such as, for example, presence of a terrace or if an apartment is sold with furniture or not.

The results of ANOVA test is presented below.

Effect	Analysis of Variance; DV: Price per meter (Krasnodar)				
	Sums of Squares	df	Mean Squares	F	p-level
Regress.	1,967704E+10	7	2,811005E+09	13,42168	0,000000
Residual	4,209696E+10	201	2,094376E+08		
Total	6,177400E+10				

Table 7. The results of the ANOVA test for the Krasnodar city model

To see the dependence of the price per square meter on purely physical characteristics that have been chosen, another regression analysis was carried out. The result of the analysis was the following equation:

Price = 53761.41 +15.26xS + 1391.73xR + 315.76xF – 503.86xA

(3)

However, the R coefficient due to the reasons mentioned above is small as well. However, if we look at the regression model of spatial characteristics of an apartment and its price per square meter we will see that R remains at the medium level which shows greater level of relation. The result of this analysis will be the equation:

Price = 72324.23 – 1834.15xC – 2119.25xN – 3054.36xT

(4)

The quality goodness in this case will be 0.3006 and F will equal 29.379.

4.3 The impact of public places on real estate prices in Prague

4.3.1 The spatial structure of Prague analysis

Over the years the internal spatial structure of the city of Prague has been expanding in a more or less conventional way as there were no protuberant obstacles in a physical landscape of the city and it was not ruined by any natural disasters. Luckily, the damage caused by World War II could be considered as omissible as well. The city developed by concentric additions in 5 major zones. According to Ludek Sýkora, these zones include: 1) the historical core; 2) the inner city of blocks of apartment houses; 3) the ring of villa neighborhoods and garden towns; 4) the circle of communist housing estates of prefabricated tower blocks; and 5) the zone of rural area with small towns and villages (Sýkora 1999).

Despite the fact that Prague is famous for its beautiful and well-preserved medieval center, the bigger part of it is formed by the neighborhoods that developed relatively recently – over the last 150 years. More than 80% of the city population lives in apartment blocks that were constructed from the middle of the 19-th century to the World War II and in neighborhoods developed during the communist era from 1960s to 1980s (Barlow, Dostal, Hampal 1994). Even though the historical center of the city makes only 2% of the administrative area of the city of only 5% of the overall population, it remains the most famous part of Prague so well-known by most of the visitors. The historical core as a central zine of the city grew along the both banks of the Vltava River since the 10th century, however it was primarily developed during the King Charles IV' rule in 14th century.

The historical core of the city is surrounded by the second zone – the inner city composed of the apartment houses of 4 to 5 floors built from the middle of the 19th century till the World War II. These building shape a regular street pattern which incorporate scattered old industrial districts. This part of the city can be definitely described as urban due to the fact that it is a home to about two fifth of the total population of Prague (Sýkora 1999). This zone in a way symbolizes the era of rapid growth of the urban borders, the increase in concentration and density and later of urban decline as the suburban way of live was preferred and the lack of investment in new construction during the communism period led to the dwellings being dilapidated.

In the beginning of the 20th century, namely in 1920s and 1930s, Prague was characterized by a dynamic urban growth as the population before the war increased to almost one million of inhabitants (Barlow, Dostal, Hampal 1994). New administrative and commercial dwellings were decided to be incorporated in the historical core of the city whereas residential buildings were constructed at the edges of the built up area. That is how, under the influence of Ebenezer Howard who promoted the combination of urban benefits with rural landscape, the ring of villa districts and small garden towns emerged (Sykora 1999). This zone of villas and garden towns served for residential purposes and its inhabitants had to commute to work in the city center.

In the communism period the city of Prague was encircled by a zone of huge prefabricated high rise buildings mainly with four to twelve floors which dramatically demarcated the external borders of the urbanized area. The construction of massive residential neighborhoods for up to 100000 residents with a lack of employment and a narrow range of services initially was planned as district unit designed for a few thousand residents with housing and basic services. It is interesting that generally the population of communist districts were younger and better educated when compared to the rest of Prague's inhabitants – they were called the "middle class of communism" (Sykora 1999). At present more than two fifth of the overall population of Prague live in these zones.

Nevertheless, a rural landscape of small towns and villages that still officially belongs to the administrative borders of Prague could be found beyond the concrete wall of the communism residential zone. To ensure that there is still a land for the future expansion of city borders that settlements were amalgamated to Prague in the end of 1960s and in the beginning of 1970s. After that time there was a decline and overall uncertainty in the communist economy that were the reasons for the reduction of investments in construction of houses. At present time there is a great potential for both residential and commercial suburbanization of these areas along with the and beyond the administrative borders of Prague.

The impact of Czech transformation policies on urban areas are the topic of the wide spectrum of literature. It seems to be clear that the processes of privatization and liberalization of prices were the main pillars of these transformations. They have led to the

following changes in urban development: 1) new societal rules emerged regulating democratic policy and the principles of free market, 2) a large number of private actors operating in the city including the owners of properties, 3) local economic system became open and transparent for the international economic forces (Pučerová 2008).

The character and nature of the public policy, and in particular the approaches of state, city and districts authorities to urban development in relation to urban planning, real estate development and housing policies, have formed the most recent changes in the urban environment of the city of Prague (Sýkora 1999). The decisions of both national and local government now are mainly based on the neo-liberal approach when a free and unregulated market as a mechanism of resource allocation would result in the emergence and development of a wealthy, socially just and economically efficient system. That is why one of the critical roles of the government was to decreased the involvement of state wherever it is possible and with a minimum hard to society and economy in particular.

In our opinion, at present the three most visible processes of urban change in Prague have been:

1) The commercialization of the historical core;

2) The revitalization in some inner city neighborhoods, which has taken the form of commercialization and gentrification;

3) Residential and commercial suburbanization in the outer city.

All the three processes are associated with a radical change of land use patterns as it considers the replacement of existing activities with new and economically more effective uses and at the same time with physical upgrading (Thomas, Morin 2012).

At present, it seems that the opportunities for further commercial development of the center of the city are nearly depleted and the office developments are now shifting towards the inner city sub-centers. The last unoccupied zones in the inner city and the borders of the communist residential districts are now the area of focus for the new up-market residential projects with apartments for sale.

There is rapidly growing development activity in areas beyond the administrative borders of the city, where light industrial, warehousing, distribution and high-turnover retail facilities accompany residential suburbanization. One of the visible trends there which will definitely influence the urban structure in the following years is the decentralization of commercial developments.

The residential development is likely to include both urbanization within the compact city through refurbishment of old and construction of new apartment housing and suburbanization represented by the establishment of new residential districts, individual

infills to built-up areas of existing communities and through reconstruction and refurbishment of rural properties.

4.3.2 Real estate and construction development in Prague

The real estate market of the Czech Republic is now seems to be one of the most promising market in the country. Supported by the stable and health economic growth, low rates for mortgages and increasing demand on both local and foreign level, the housing market rapidly growth stronger. According to the Czech Statistical Office, the average price of apartments during the last year till the end of the third quarter of 2015 has increased by 5.42% (or 4.93% in real terms) (Prices of Real Estate: Statistics 2016).

Up till the end of the third quarter of 2015:

• The average price of new buildings that are being sold rose by 4.3 % (3.2% in real terms) as the Czech National Bank states (Publications issued by the Czech National Bank 2016). This indicator means that the real estate market has recovered from the crisis as it is by 3.2% better compared to its level in the third quarter of 2008.
• The average price for the already existing dwellings increased by 3.6% (or 2.5% in real terms) which is however still 3% lower than in the third quarter in 2008 (Publications issued by the Czech National Bank 2016).

Due to the low mortgage rates and the continuously improving economic conditions there has been seen a rise of demand for the real estate prices. According to the local real estate experts, the number of apartments that were sold in 2015 has already surpassed the demand before the international financial crisis in 2015. "Since late in 2012, sales have been picking up significantly," says Peter Visnovsky of Lexxus, a Czech-based real estate firm (Czech house prices continue to rise 2016).

The stimulation of demand can be also caused on the international level by the under value of crowns as a currency. "This stimulates the demand from foreign buyers as well as Czech expats working and living in the E.U.," says Lukas Cichon of real estate company Svoboda & Williams (Czech house prices continue to rise 2016). Despite the fact that the majority of property sales is accounted for the Czech citizens, there is a rising demand from the international investors from Western Europe, particularly from Britain, Germany, and Italy. Other foreign buyers come from Russia, Ukraine and other former Soviet republics.

The pricing of real estate market in Czech Republic has undergone several stages:

1) The 1998-2003 lift. According to the Czech National Bank, due to the forthcoming entry to the European Union in 2004 and the promoted by government spending binge, though with rising public deficits, the residential house price index has increased by 64%. During this period the price for apartment blocks rose the most – at 118%. The price for individual apartments increased drastically as well – by 91%. The

price of small houses for a single family rose 58% and the building plot prices increased 31% (Publications issued by the Czech National Bank 2016).

2) Stagnation from 2004-2005. After the long discussions on the parliamentary level it was decided to restrict the purchase of property until 2009 for a seven years transition period for non-Czech residents even if they held an EU citizenship. That resulted in the stagnation of the market from 2004 to 2005. At that period in 2004 the average price for apartments decreased by 2.7% but then increases by the same level in 2005.

3) Brief rise in 2006-2008. Due to the low interest rates, the house price index increased in 2006 by 8.4% (or 5.7% in real terms). The construction of new dwellings increased by 38% with 41649 units to be built which was one of the reasons for the increase of the house price index in 2007 by 31.2% (Czech house prices continue to rise 2016).

4) The crisis of 2009-2013. After the promising 17.1% year to year growth in 2008, because of the international financial crisis the prices of apartments dropped by 12.3% in 2009. Nevertheless, the construction of new dwellings continued. The number of completions in 2008 and 2009 was still higher than in 2007. However, in 2010 the number of construction starts fell by 24.6% with 27535 dwellings expected to be completed in 2011. House prices decreased by 2.74% in 2010 and then later in 2011 by 4.92%, according to the figured from the Czech Statistical Office (Prices of Real Estate: Statistics 2016). After decreasing by 5.39% in 2012, the prices on the real estate market dropped 1.68% in 2013.

5) Real estate market recovery 2014-2015. With the improvement of the overall economic situation, the house price index in 2014 increased by 5.68% which seems to be the start of the recovery processes on the property market. Since then the real estate market has recorded steady but modest increase in prices for properties.

After the several years of unpromising performance, it looks like the sector of residential construction is getting tis positions back. The number of completed dwelling in 2015 increased by 4.8% to 25094 units after the series of declines in 2014 and 2013(Prices of Real Estate: Statistics 2016).

At the same time, the number of starts of constructions in 2015 rose by 8.3% to 26378 units expected which is a good indicator of constant year-to-year decline from 2008 to 2013. That generally means that investors are coming back to the real estate market.

The favorable conditions are also created by the Czech National Bank that has been continuously lowering the key interest rate since 2009. In December 2012 it set a record when it was as low as 0.05% which is a significant change compared to 3% before the crisis in 2008. This remains unchanged, along with the discount rate (at 0.05%) and the Lombard rate (at 0.25%), to encourage and support the economy and discourage an appreciation of the crowns as the national currency (Czech house prices continue to rise 2016). Also mortgage interest rates go on decreasing. In December 2015 an average

interest rate for a mortgage loan decreased to 3.29% whereas it was 3.73% one year earlier (Publications issued by the Czech National Bank 2016).

Residential construction activity is expected to continue increasing in 2016, as the oversupply in the housing market starts getting absorbed.

4.3.3 Specifications of the model
4.3.3.1 Data specification

The database for construction of the model for the city of Prague includes 200 observations of real estate residential properties being on sale from November, 2015. To access the impact of spatial location of a residential property it has been decided to collect the equal number of cases for every urban district of Prague which means that we have evaluated 20 cases in every district of Prague 1, Prague 2, Prague 3, Prague 4, Prague 5, Prague 6, Prague 7, Prague 8, Prague 9, and Prague 10 (See Appendix 2).

Picture 9. The map of Prague urban districts borders (Prague map 2016)

Prague 1 is the central district of the city. The territory of the district is 5.53 square kilometers with the population more than 32550 people. The district incorporates the medieval part of the city in such historical neighborhoods as Josefov, Stare Mesto, Mala

Strana, and others. There are 18821 houses located in Prague 1 (Apartments, commercial premises and privatization Praha 1 2016). According to our estimations, the average price per square meter of a residential apartment in Prague 1 is 134094.98 CZK.

Prague 2 is the district with the smallest area which is just 4.19 square kilometers. As at January, 2009 the population of Prague 2 was 51003 residents (Praha 2: Statistical Information about Prague 2 2016). Accommodation in the administrative district of Prague 2 for many citizens remains a very attractive target. The proximity to the historical center, developed infrastructure, combined with a relatively quiet pace of life in the sleeping area of the city and the overall favorable environmental conditions compensate for some of its shortcomings. However those who are going to buy property here must be ready to face the challenges with car parking. The almost complete absence of vacant land and the impossibility of demolition of historic buildings do not allow conducting active construction in the area. The cost of real estate is one of the highest in Prague – the average price per square meter is estimated to be 85620.34 CZK.

Prague 3 district area of 6.49 sq. km. was formed as a modern administrative unit in 1960. The population of Prague 3 accounts for 78424 (2006) residents (Information Praha 3 2016). The cost of real estate in Prague 3 is relatively lower than in city center due to the less beautiful architecture of the area, not very good condition of streets, the presence of prefabricated houses in the housing stock, and incomplete process of reconstruction of old buildings. But the convenient communication with other parts of Prague, a large number of natural parks and the active construction of new homes, providing a high quality of life, makes Prague 3 district is very attractive in terms of real estate purchase. The average price per square meter of residential area in Prague 3 is 85164.65 CZK.

The urban district Prague 4, founded in 1960, is located on the right bank of the Vltava River and covers an area of about 24 square kilometers. Being the biggest district of the capital, Prague 4 is home to 134030 people (MČ Praha 4: Housing 2016). Prague 4 is the area in which there are new skyscrapers and old panel five-story buildings, modern roads and quiet parks, historic landmarks, great shopping malls, sports facilities and complexes. The big advantage of the area is the absence of industry and good environment. The average price per one square meter of residential property there will be 61135.99 CZK.

Prague-5 is one of the administrative districts of Prague located on the left bank of the Vltava River, directly opposite to the historic city center. The area of 27.5 of square kilometers makes Prague 5 the second largest municipality on the left bank of the capital with the population of 85182 (2006) (Office - City Quarter of Prague 5 2016). Residential capital of the district is diverse and, in general, refers to the prestigious class. The average price per one square meter of residential property there will be 66262.52 CZK.

Prague 6 is the largest administrative district of Prague, located in the northwest of the city on the territory of 41.54 square kilometers. The population of the district is 103040

residents (Prague 6 2016). Prague 6 is a vast area with a rich historical past and the many well-preserved monuments. Pros of the district are its good environment and location - from the city center it can be reached in a matter of minutes. The average price per square meter here will be 79843.74 CZK.

Prague7, one of the administrative districts of Prague, is located in the loop of the Vltava River, close to the city center. The area of the district is 7.10 km², the population – 40516 (MC Praha 7: Welcome to Prague 7 City District, 2016). Prague 7 is one of the most prestigious districts thanks to its proximity to the center, developed transport network (2 underground stations, plenty of tram and bus lines), a beautiful promenade and numerous green spaces. The average price per square meter of the residential property here is 77552.88 CZK.

City District Prague 8 stretches in the north-eastern part of Prague and is divided into 9 neighborhoods. The present boundaries of Prague 8 were finally established in 2002. The district is spread over 21.82 km^2 and is populated by 103,000 people (MČ Praha 8: Basic information about Prague 8, 2016). The average price per square meter here will be 67039.67 CZK.

Prague 9 is a fairly large administrative district of Prague, located in the north-east of the center. This area has long been known as a sleeping area and had not attracted much attention from either tourists or potential investors of property due to its relative remoteness from the city center (Praha 9: Overview 2016). The average price per square meter in Prague 9 is 58528.5 CZK.

Prague 10 is considered to be quite young, despite the fact that some of its neighborhoods have had their history since the early Middle Ages. Partially preserved historical buildings in the district are interspersed with modern houses and villas. Despite the fact that Prague 10 is located quite close to the city center, there the rhythm of the modern metropolis is not felt thanks to an abundance of parks, tourist and excursion sites. In the territory of present-day Prague 10 we will find approximately 7 thousand houses and 55 thousand flats in which approximately 111 thousand of inhabitants live today (Municipal District Prague 10, 2016). The average price per square meter in Prague 10 is 61582.55 CZK.

On the following graph you can see the comparison of average prices per square meter of residential property in all 10 districts of Prague.
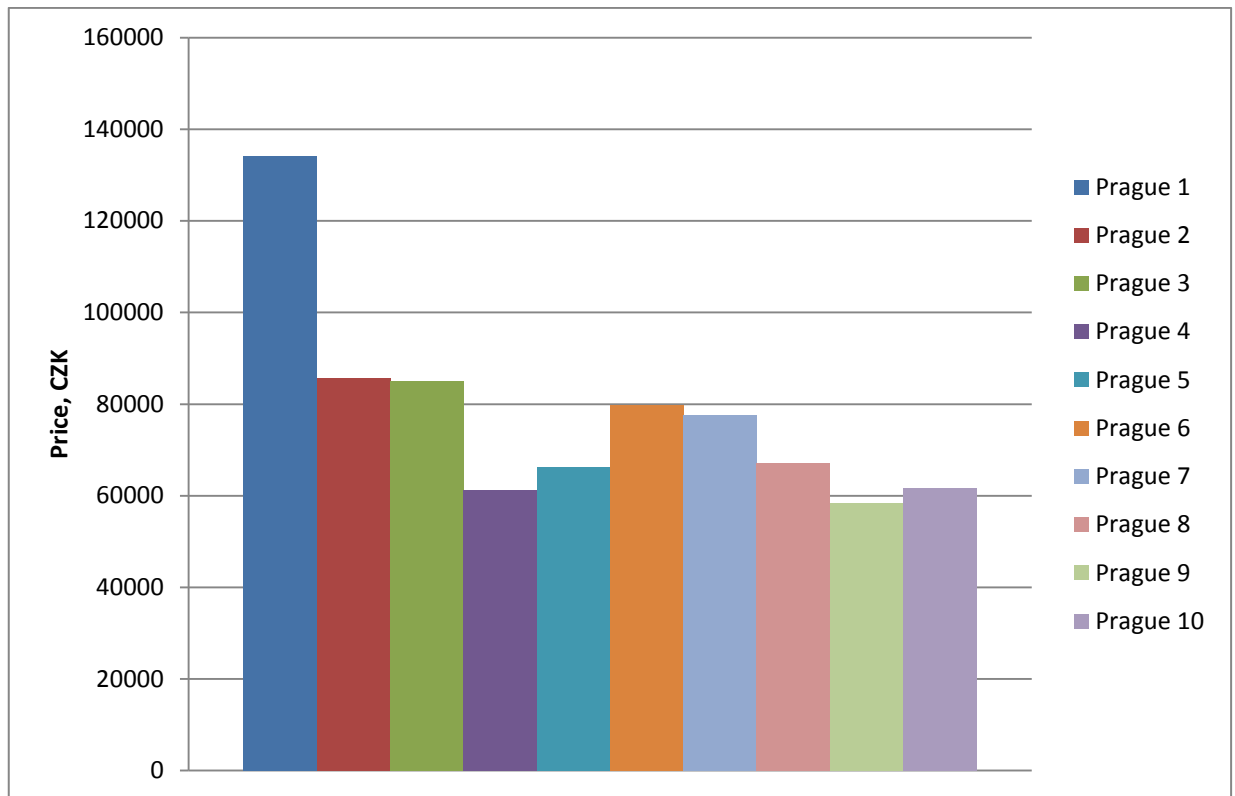
Picture 10. The comparison of prices for 1 square meter of residential properties in city districts of Prague for 2015-2016, CZK

The sources for all the data can be seen in the Appendix 2. It is worth mentioning that data collecting in Prague as a researcher is a foreigner included attending and visiting most of the observations and their neighborhoods, for example, to evaluate what could be considered the nearest public place.

4.3.3.2 Variables specification

As in case of the city of Krasnodar, to make the model comparable it was decided to introduce 1 dependent variable and 7 independent variables: 4 variables characterizing the physical features of a dwelling and 3 variables displaying it spatial relations. It has been decided to choose these variables exactly as they were present in all the data sources in a unified form.

The variables applied include:

1)   The price for a square meter as a dependent variable;

2)   The size of an apartment;

3)   The number of rooms;

4)   The floor of a real estate property;

5) The age of a dwelling;

6) The distance to the city center;

7) The distance to the nearest public space;

8) The distance to the nearest stop of a public transport.

Considering the age parameter, it has been decided that a dwelling is thought to be old if it was constructed before 2014 and therefore valued as 0 and is thought to be new if it was constructed after 2016 and hence is valued 1.

To measure the distance to the city center, it was decided to measure the distance from the dwelling to the Staromestskenamesti (Old Town Square). The square features various architectural styles including the Gothic Church of Our Lady before Tyn, which has been the main church of this part of the city since the 14th century; the church's towers are 80 m high. Prague Orloj is a medieval astronomical clock located on the Old Town Hall. The Baroque St. Nicholas Church is another church located in the square, while the tower of the Old Town Hall offers a panoramic view of Old Town. An art museum of the Czech National Gallery is located in Kinsky Palace. The square also accommodates markets.

By the nearest public space we understand the closet locations of public activities which as indicated in previous chapters are physical spaces of a city. For the model construction we calculate the distance from a residential property to an external public place.

The final variable is the distance between an internal public space such as a public transport stop and an observed residential property.

4.3.4 Construction of the model
To evaluate the influence of the proximity to public spaces on the price of the residential property in Prague, a hedonic price model was designed. Using the tools of the Statistica program, the correlation matrix was constructed.

	Pricepersqu aremeter	Size of a lot	Numbero frooms	Floo r	Age	Distancet oCenter	Distancet oPlace	Distance toStop
Pricepersqu aremeter	1,00							
Sizeof a lot	0,05	1,00						
Numberofr ooms	0,00	0,66	1,00					
Floor	-0,01	0,09	0,02	1,00				
Age	-0,13	0,13	0,05	-0,09	1,00			
Distanceto Center	-0,55	-0,17	-0,11	-0,08	0,33	1,00		
DistancetoP lace	-0,50	0,01	0,01	-0,08	0,24	0,45	1,00	
DistancetoS top	-0,11	-0,04	-0,10	0,07	0,12	0,20	0,12	1,00

Table 8. Correlation matrix of the Prague model factors

If correlation coefficients in the matrix are negative, it means an opposite dependence of variable: the higher the value of one variable is, the lower the value of another gets. Therefore, we can see that, for example, the further an apartment is from the city center, the smaller its prices gets.

To support the correlation analysis the covariation matrix was constructed.

Variable	Covariances (Prague)							
	Size	Rooms	Floor	Age	City Center	Nearest place	Stop	Price per meter
Size	1699,75	29,368	10,704	1,97	-22,2	0,07	-0,287	6,772972E+04
Rooms	29,37	1,169	0,051	0,02	-0,4	0,00	-0,019	-1,021929E+02
Floor	10,70	0,051	8,366	-0,09	-0,7	-0,05	0,036	-5,625656E+02
Age	1,97	0,020	-0,094	0,14	0,4	0,02	0,008	-1,656729E+03
City Center	-22,23	-0,387	-0,730	0,40	10,2	0,31	0,116	-5,839932E+04
Nearest place	0,07	0,003	-0,051	0,02	0,3	0,05	0,005	-3,655323E+03
Stop	-0,29	-0,019	0,036	0,01	0,1	0,00	0,034	-6,864185E+02
Price per meter	67729,72	-102,193	-562,566	-1656,73	-58399,3	-3655,32	-686,419	1,098047E+09

Table 9. Covariation matrix for the Prague model factors

According to the selected factors, multiple regression analysis was carried out. 200 cases were processed and 200 cases were found to be acceptable. The results of the analysis are summarized in the table below.

Regression Summary for Dependent Variable: Price per meter (Prague) R= ,63103594 R?= ,39820636 Adjusted R?= ,37626596 F(7,192)=18,149 p<,00000 Std.Error of estimate: 26170,						
N=200	**Beta**	Std.Err. of Beta	B	Std.Err. of B	t(192)	p-level
Intercept			124165,5	7570,58	16,40107	0,000000
Size	0,009241	0,076932	7,4	61,83	0,12012	0,904511
Rooms	-0,057337	0,074969	-1757,6	2298,04	-0,76480	0,445328
Floor	-0,059446	0,056925	-681,1	652,17	-1,04430	0,297661
Age	0,089189	0,061246	7942,3	5454,03	1,45623	0,146963
City Center	-0,443245	0,067364	-4590,9	697,72	-6,57982	0,000000
Nearest place	-0,329468	0,063299	-49681,7	9545,10	-5,20494	0,000000
Stop	0,002958	0,057736	532,5	10395,00	0,05123	0,959195

Table 10. The results of the regression analysis for the city of Prague

Therefore, the final equation will take the following form:

Price = 124165.5 + 7.4xS – 1757.6xR – 681.1xF + 7942.3xF – 4590.9xC – 49681.7xN + 532.5xT

(5)

Where:

- S is the size of a lot;
- R is the number of rooms;
- F is the floor of the apartment;
- A is the indicator whether the lot is new or old;
- C is the distance to the city center;
- N is the distance to the nearest public space;
- T is the distance to the nearest public transport stop.

The results of the model can be seen in the following table.

Equation	t-test for S = 0.12012 for R = -0.76480 for F = -1.04430 for A = 1.45623 for C = -6.57982 for N = -5.20494

	for T = 0.05123
	= 124165.5 + 7.4xS − 1757.6xR − 681.1xF + 7942.3xF − 4590.9xC − 49681.7xN + 532.5xT
R	0.39820636
F	18.149

Table 11. The summary of the model for the city of Prague

The quality of the model is medium as quality goodness equals 0.39820636. It can be explained first of all by the small number of variables chosen. As mentioned before, it has been decided to focus on physical characteristics of an apartment in comparison to its spatial relations. Such variables as the size of a lot, the number of rooms, the floor where an apartment is situated and the age of a building were chosen as they were accessible at all the platforms used for data collection therefore all the cases were treated equally. In practice, the price of a square meter definitely depends on other factors as well, such as, for example, presence of a terrace or if an apartment is sold with furniture or not.

The ANOVA test for the model took the following form.

	Analysis of Variance; DV: Price per meter (Prague)				
Effect	Sums of Squares	df	Mean Squares	F	p-level
Regress.	8,701257E+10	7	1,243037E+10	18,14946	0,000000
Residual	1,314987E+11	192	6,848890E+08		
Total	2,185113E+11				

Table 12. The results of the ANOVA test for the Prague city model

To see the relation between the price per square meter of the residential property and merely physical characteristics of it another multiple regression analysis was conducted. The result of it was the following equation:

Price = 78055.9 + 96.4xS − 2263.8xR − 325.7xF -013225.4xA

(6)

However, the R coefficient due to the reasons mentioned above is small - it equals just 0.2627511. But at the same time, if the multiple regression analysis is conducted in relation to spatial characteristics of the residential property, the goodness coefficient stays relatively at the same level − R equals 0.38504624. It means that price per meter will correspond better to the distance parameters. The equation of this analysis will be

Price = 116454.6 – 4237.4xC – 48201.9xN +1244.7xT

(7)

4.4 Limitations of the models

As this kind of models is basically oriented on sales, one of the limitations was the absence of data on sales property contracts with the real characteristics of the dwellings being sold. Therefore, it was impossible for us to find the information on sales contracts. That is why we were oriented towards the market and took into account the properties offered for sale at biggest and most popular real estate agencies. In this way, we could get more accurate information regarding properties characteristics. Of course, this information was limited and depended on the best apartment characteristics that potential sellers wanted to advertise, but a more complete information would have brought more complete results from the model. On the other side, in the context of the study while contractual sales price is oriented by the reference price (Thanasi, Hysi, 2013), the applied methodology has resulted in better evaluations of real estate prices, which reflect the market price.

Variables included in the model belong to the category of structural variables and the location, while due to lack of data; the model could not include variables that represent the characteristics of the neighborhood, as well as other variables that have been identified to affect the value of property. The inclusion in the model of other useful data such as distance of the property from workplaces, schools and shopping centers, the level of crime, quality of education and hospital services, local tax rate property, information on the days that property remains on the market without being sold, would help improve the performance of the models.

Identification of the reference area where the property was located is carried out manually for each property and this may be associated with human errors. This problem can be solved through the use of geographic information systems that enable clear geographical identification of the property according to specific neighborhoods within the areas of assessment. This limitation is also connected to the peculiarity of Czech real estate market not to provide information of the house number: that is why it was necessary to calculate distances from the average location of the street. For example, as you can see on the picture, the street of Evropska in Prague is quite long but due to the lack of information on the exact location of the house, we had to take the initial indicator proposed by Google maps.

Picture 11. The illustration of the distance estimation limitations (Google maps 2016)

5 Results and research findings

5.1 Results: meeting the objectives

In accordance to the research goal the major result of the diploma thesis is that the hypothesis set in the beginning and stating that a public space is a one of the key elements of any urban environment was proven by evaluating the influence of public spaces on the formation of real estate prices for residential properties in the cities of Krasnodar and Prague through constructing econometric models. The research questions were fully answered in the previous chapters of the diploma thesis by following the order of given objectives.

Firstly, the existing approaches to urban studies were specified by overviewing their development from their emergence up to modern days. The fundamental German school of urban location studies represented in the diploma thesis by the works of Johann Heinrich von Thunen, Alfred Weber, Walter Christaller, and August Losch. Urban morphology approach, positivist, behavioral, humanistic and structuralism approaches were given account of. A special attention was paid to recent approaches to urban location studies which led to understanding the contemporary role of cities in a world economy. The author identified the processes of urban areas going global and the special features of urban areas' functioning in a globalized economy. The study of modern activities tied to urban restructuring was provided where the possible ways of the future urban development were proposed.

In the diploma thesis an urban environment was defined as a collection of various spaces. The peculiarities of a physical space of an urban environment were determined and several components of it such as paths, edges, nodes, districts and landmarks were identified. The dimension of the economic space of a city was studied by looking into factors driving the economic development of urban areas. The features of social and cultural spaces of an urban environment were examined underlining their importance for the continuous urban improvement. The nature of the public space of an urban environment was scrutinized to see that a public space in a way merges economic, social and cultural activities while connecting them to its physical environment.

The real estate development processes in the diploma thesis were successfully linked with the overall urban development. The influence of public spaces, and namely the proximity to them, was estimated by constructing two econometric models for the cities of Krasnodar, the Russian Federation, and Prague, the Czech Republic. The results of the models imply the price for the square meter of a residential property such as an apartment strongly depends on the proximity to the city center and to the nearest to the dwelling public space. Therefore, all of the set research objectives were met.

5.2 Comparing the models for Prague and Krasnodar

Overall the model of relation of price per square meter of a residential property to its physical and spatial characteristics tends to have more value if applied to the city of Prague than to Krasnodar as the quality goodness is better accordingly. If we compare physical features of a dwelling, they seem to have less influence to the price per meter than the location of an apartment in both cities. However, it is visible that location in Prague has more influence on the price formation than location in Krasnodar.

Distance to the city center tends to have the biggest impact on price per square meter than any other spatial characteristic. The impact of distance to the city center in Prague though is bigger than the one it has in Krasnodar. The same trend is visible with the distance to nearest public place – the closer an apartment is to a public space, the greater value it gets. This trend also seems to be more developed in Prague than in Krasnodar.

The distance to the nearest public transport stop is relatively small and doesn't affect much the price per square of the residential property. It is interesting that nevertheless in the city of Krasnodar it is a more important factor than in Prague. It can be explained by the better development of Prague transportation system whereas on Krasnodar there is still a lot to be done in this area.

5.3 Proposals for the future research

Even though the studies of urban areas grow in popularity, there are still a lot of uncovered areas, some of which are connected with various urban spaces, for example, deepening the understanding of bonds between physical, economic and socio-cultural dimensions. However, the author is mainly concerned with the studies of public places of urban areas. As recent researchers are dwelling primarily on legal, political, social and architectural features of a public space, there still remains an uncovered economic potential of their development. That is why it seems to be relevant to study economic opportunities of public spaces, for example, the ways of their monetization. These studies may be also concerned with overall evaluation of public spaces – identifying the factors of their success, including the economic efficiency of a public space, will allow to formmore focused urban development strategies. The first step in this direction might be examining other economic influences of public places except for real estate prices formation. The author is inclined to continue the research and is willing to estimate the impact of public places to the prices for non-residential and commercial properties in their proximity.

6 Conclusion

As the world is constantly changing making immense alterations and elaborating in its complexity the approaches towards studying urban categories are evolving, most of them undergoing drastic changes. The studies of urban phenomena are gaining wider perspectives as more and more angles are being discovered. One of them is seeing an urban area as a collection of various spaces that are interacting and overlapping constantly: physical, economic, social, and cultural. A public space of an urban environment as one of its key elements seems to incorporate characteristics of all the mentioned spaces while combining economic, social and cultural activities and tying them to its physical features.

It has been always clear that a spatial environment and people are in a state of constant dynamic relationship. The nearest environment in which a person is active is the area of his or her residence: the city district, quarter, street, house, and yard. All the components of this logical series are interrelated, but have different effects on human activities, the formation of its economic, political, social, cultural and others connections.Philosophical understanding of a city and its problems, of an urban environment and its categories requires appealing to the rich experience of the theoretical study of urban space. In many respects the urban environment shapes interpersonal relations, performing a sort of mediating role, as well as providing a significant impact on personal development, it defines space as a dynamic system of human (individual and group) relationships and communications. It could be said that a city is a unique institute, where due to its peculiarities heterogeneous human communities enter into communication.

The heart of every city is innovation. We believe that placemaking and public spaces development may be the innovation needed in the various cities of Russia, including Krasnodar and some of the cities of Czech Republic. Generally, a public space may be a gathering spot or part of a neighborhood, downtown, special district, waterfront or other area within the public realm that helps promote social interaction and a sense of community. Great public spaces are where celebrations are held, social and economic exchanges take place, friends run into each other, and cultures mix. Not only do public spaces generate a comfortable urban environment, making the city attractive both to the residents and to the tourists but they also create a feeling of belongingness, affinity, and desire to invest and contribute. When the spaces work well, they serve as a stage for public lives.

The research has shown that such a sophisticated and elaborate system as a city needs to be paid attention to from all the points of its functioning. The right strategies will allow cities to prosper in the ever changing global environment and help them face the challenges. One of the possible strategies may be the development of public areas and public spaces as the research has proven their importance. Such strategies will be an impulse to the economic growth of cities, improvement of the quality of life and renewal of social and cultural urban environment.

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8 Appendix

Appendix 1. Data for the econometric model for Krasnodar

Part 1. Physical characteristics of properties

Address	District	Price per square meter	Price of apartment	Property space	No of rooms	Floor	Age
Stavropolskaya 18	West	48500,00	3880000,00	80,00	3,00	8,00	1,00
Stavropolskaya 18	West	50000,00	3400000,00	68,00	2,00	8,00	1,00
Stavropolskaya 18	West	49926,47	3395000,00	68,00	2,00	7,00	1,00
Stavropolskaya 18	West	51125,00	2454000,00	48,00	1,00	10,00	1,00
Minskaya 122/11	West	66842,11	6350000,00	95,00	3,00	3,00	0,00
Minskaya 122/2	West	60408,16	5920000,00	98,00	3,00	11,00	0,00
Minskaya 122	West	61475,41	7500000,00	122,00	3,00	10,00	0,00
Minskaya 59	West	52631,58	7000000,00	133,00	3,00	5,00	1,00
Minskaya 59	West	56390,98	7500000,00	133,00	3,00	6,00	1,00
Minskaya 122/13	West	75000,00	6750000,00	90,00	3,00	7,00	0,00
Kozhevennaya 24	West	65384,62	6800000,00	104,00	3,00	15,00	1,00
Prospect Chekistov 38	West	63333,33	3800000,00	60,00	2,00	14,00	0,00
Prospect Chekistov 38	West	58461,54	3800000,00	65,00	2,00	5,00	0,00
Prospect Chekistov 40	West	81395,35	3500000,00	43,00	1,00	5,00	0,00
Prospect Chekistov 24	West	84313,73	4300000,00	51,00	2,00	13,00	0,00
Rozhdestvenskaya Naberezhnaya	West	77812,50	2490000,00	32,00	1,00	1,00	0,00
Prospect Chekistov 8/4	West	81578,95	6200000,00	76,00	2,00	2,00	0,00
Prospect Chekistov 8/4	West	72761,19	3900000,00	53,60	1,00	5,00	0,00
Kozhevennaya 60	West	82608,70	3800000,00	46,00	1,00	15,00	1,00
Kozhevennaya 54	West	31785,71	1780000,00	56,00	2,00	2,00	0,00
Kalinina 350/6	West	56164,38	4100000,00	73,00	3,00	12,00	0,00
Brusova 18	West	55681,82	2450000,00	44,00	2,00	1,00	0,00
Gertsina 203	West	55362,32	3820000,00	69,00	3,00	3,00	0,00
Vorovskogo 137	West	54687,50	1750000,00	32,00	1,00	3,00	1,00
Karla Marxa 79	West	66666,67	3800000,00	57,00	2,00	8,00	0,00
Karla Marxa 75	West	49206,35	3100000,00	63,00	3,00	2,00	1,00
Golovatogo 172	West	65714,29	4600000,00	70,00	2,00	14,00	1,00
Kalinina 350/7	West	52000,00	3900000,00	75,00	3,00	14,00	1,00
Karla Marxa 14	West	67241,38	3900000,00	58,00	2,00	8,00	1,00
Koltsevaya 38/1	West	50877,19	2900000,00	57,00	2,00	5,00	0,00

Luzana 41	West	46875,00	3000000,00	64,00	3,00	5,00	0,00
Luzana 41	West	62500,00	3000000,00	48,00	2,00	1,00	0,00
Koltsevaya 9	West	58111,38	2400000,00	41,30	2,00	1,00	0,00
Luzana 4	West	57812,50	3700000,00	64,00	2,00	15,00	1,00
Shosse Neftyannikov 19	West	64285,71	4500000,00	70,00	4,00	1,00	1,00
Shosse Neftyannikov 9/1	West	111111,11	15000000,00	135,00	4,00	4,00	1,00
Dzerzhinskogo 35	West	47445,26	6500000,00	137,00	3,00	5,00	0,00
Bryanskaya 8	West	55421,69	4600000,00	83,00	4,00	6,00	0,00
Rashpilevskaya 180	West	63291,14	5500000,00	86,90	4,00	7,00	0,00
Odesskaya 29	West	91839,08	7990000,00	87,00	4,00	7,00	1,00
Dzerzhinskogo 11/11	West	64444,44	2900000,00	45,00	2,00	5,00	0,00
Khakurate 2	West	60000,00	3600000,00	60,00	3,00	4,00	0,00
Rashpilevskaya 127	West	45714,29	1600000,00	35,00	2,00	1,00	0,00
Budennogo 129	West	70070,00	3503500,00	50,00	1,00	6,00	1,00
Budennogo 129	West	65098,04	3320000,00	51,00	1,00	4,00	1,00
Budennogo 129	West	78524,59	4790000,00	61,00	1,00	16,00	1,00
Budennogo 129	West	77500,00	6200000,00	80,00	2,00	15,00	1,00
Golovatogo 292/3	West	82500,00	3300000,00	40,00	1,00	12,00	0,00
Golovatogo 294	West	87500,00	2100000,00	24,00	1,00	1,00	0,00
Rashpilevskaya 100	West	82857,14	2900000,00	35,00	2,00	2,00	0,00
Oktyabrskaya 181/2	West	64583,33	3100000,00	48,00	1,00	10,00	1,00
Oktyabrskaya 181/2	West	75510,20	3700000,00	49,00	1,00	2,00	1,00
Oktyabrskaya 181/3	West	78666,67	5900000,00	75,00	2,00	7,00	1,00
Rashpilevskaya 32	West	103448,28	6000000,00	58,00	2,00	3,00	0,00
Krasnaya 27	West	61320,75	3250000,00	53,00	1,00	15,00	0,00
Pushkina 14	West	89625,00	7170000,00	80,00	1,00	10,00	1,00
Pushkina 14	West	88532,11	9650000,00	109,00	2,00	10,00	1,00
Rechnaya 11	West	62222,22	2800000,00	45,00	2,00	4,00	0,00
Stankostroitelnaya 18	West	68750,00	2200000,00	32,00	1,00	1,00	0,00
Sovetskaya 35	West	70000,00	3500000,00	50,00	3,00	3,00	0,00
Pokryshkina 2/3	Prikubansky	39500,00	2765000,00	70,00	2,00	7,00	1,00
Pokryshkina 2/3	Prikubansky	40000,00	1840000,00	46,00	1,00	12,00	1,00
Pokryshkina 2/3	Prikubansky	40000,00	1760000,00	44,00	1,00	17,00	1,00
Agrohimicheskaya 138/2	Prikubansky	31964,81	1090000,00	34,10	1,00	9,00	1,00
Agrohimicheskaya 138/2	Prikubansky	29411,76	2000000,00	68,00	2,00	9,00	1,00

Ismailskaya 72	Prikubansky	34555,56	2177000,00	63,00	2,00	1,00	1,00
Ismailskaya 73	Prikubansky	37000,00	1942500,00	52,50	2,00	3,00	1,00
Ismailskaya 74	Prikubansky	35000,00	1204000,00	34,40	1,00	1,00	1,00
Sovkhoznaya 1	Prikubansky	54958,68	13300000,00	242,00	4,00	24,00	1,00
Sovkhoznaya 1	Prikubansky	44776,12	3000000,00	67,00	2,00	19,00	1,00
Sovkhoznaya 1	Prikubansky	51923,08	2700000,00	52,00	1,00	19,00	1,00
Gagarina 111	Prikubansky	31481,48	1700000,00	54,00	2,00	2,00	0,00
Atarbekova 1	Prikubansky	68604,65	5900000,00	86,00	3,00	13,00	0,00
Repina 5	Prikubansky	44988,40	1939000,00	43,10	1,00	3,00	0,00
Simirenko 37	Prikubansky	56923,08	3700000,00	65,00	2,00	2,00	0,00
40 Let Pobedy 135	Prikubansky	44666,67	3350000,00	75,00	3,00	1,00	0,00
40 Let Pobedy 15	Prikubansky	90196,08	4600000,00	51,00	1,00	5,00	0,00
40 Let Pobedy 15	Prikubansky	52857,14	1850000,00	35,00	1,00	13,00	0,00
Montazhnikov 1/2	Prikubansky	47368,42	3600000,00	76,00	2,00	11,00	0,00
Atarbekova 45	Prikubansky	75862,07	2200000,00	29,00	1,00	3,00	0,00
Gavrilova 27/1	Prikubansky	58333,33	3150000,00	54,00	1,00	14,00	0,00
Gavrilova 27/1	Prikubansky	69565,22	3200000,00	46,00	1,00	7,00	0,00
Gavrilova 27	Prikubansky	62745,10	3200000,00	51,00	1,00	20,00	0,00
Kalinina 13	Prikubansky	64516,13	2000000,00	31,00	1,00	4,00	0,00
Zapadnaya 2	Prikubansky	35600,00	890000,00	25,00	1,00	2,00	1,00
Lukyaninko 103	Prikubansky	46500,00	1860000,00	40,00	1,00	12,00	0,00
Lukyaninko 7/1	Prikubansky	48065,48	3230000,00	67,20	2,00	12,00	0,00
Kurgannaya 144	Prikubansky	34492,75	2380000,00	69,00	3,00	2,00	0,00
Kovaleva 5	Prikubansky	70731,71	2900000,00	41,00	1,00	10,00	0,00
Atarbekova 25	Prikubansky	48611,11	1750000,00	36,00	1,00	4,00	1,00
Yana-Poluyana 50	Prikubansky	42187,50	2700000,00	64,00	3,00	3,00	0,00
Arkhitektora Ishunina 8	Prikubansky	79473,68	7550000,00	95,00	3,00	11,00	1,00
Arkhitektora Ishunina 8	Prikubansky	100917,43	11000000,00	109,00	3,00	3,00	1,00
Turgeneva 144	Prikubansky	64516,13	4000000,00	62,00	3,00	8,00	0,00
Dalnyaya 4	Prikubansky	45192,31	4700000,00	104,00	3,00	5,00	1,00
Turgeneva 191	Prikubansky	53846,15	3500000,00	65,00	3,00	5,00	0,00
Turgeneva 219	Prikubansky	51587,30	3250000,00	63,00	3,00	4,00	0,00
Dzerzhinskogo 127	Prikubansky	43283,58	2900000,00	67,00	3,00	5,00	1,00
Lazurnaya 68	Prikubansky	51785,71	2900000,00	56,00	3,00	5,00	0,00
Korenovskaya 39	Prikubansky	66037,74	3500000,00	53,00	2,00	4,00	0,00
Dzerzhinskogo 224	Prikubansky	58181,82	3200000,00	55,00	2,00	6,00	0,00
Musorgskogo 19	Prikubansky	40540,54	1500000,00	37,00	1,00	2,00	1,00
Ussuriiskaya 27	Prikubansky	34594,59	1280000,00	37,00	1,00	6,00	1,00
Zipovskaya 42	Prikubansky	50500,00	2020000,00	40,00	1,00	14,00	1,00
Vorovskogo 237	Prikubansky	40500,00	810000,00	20,00	1,00	5,00	0,00
Gagarina 158	Prikubansky	40408,16	1980000,00	49,00	2,00	3,00	0,00

Cherkasskaya 70	Prikubansky	44615,38	2900000,00	65,00	2,00	12,00	1,00
Cherkasskaya 5	Prikubansky	36363,64	2800000,00	77,00	2,00	7,00	0,00
Zhloby 135	Prikubansky	63157,89	2400000,00	38,00	2,00	16,00	1,00
Peredoвая 56	Prikubansky	35000,00	1400000,00	40,00	1,00	1,00	0,00
Parusnaya 1	Karasunsky	37990,97	1683000,00	44,30	1,00	6,00	1,00
Parusnaya 1	Karasunsky	37994,14	2595000,00	68,30	2,00	7,00	1,00
Parusnaya 1	Karasunsky	43777,78	1970000,00	45,00	1,00	11,00	1,00
Parusnaya 10	Karasunsky	45633,10	1971350,00	43,20	1,00	3,00	1,00
Parusnaya 10	Karasunsky	43929,62	2996000,00	68,20	2,00	3,00	1,00
Parusnaya 10	Karasunsky	43024,83	1906000,00	44,30	1,00	16,00	1,00
Uralskaya 75	Karasunsky	44545,45	1960000,00	44,00	1,00	10,00	1,00
Uralskaya 75	Karasunsky	49375,00	1580000,00	32,00	1,00	17,00	1,00
Uralskaya 100	Karasunsky	41191,71	1590000,00	38,60	1,00	2,00	1,00
Uralskaya 100	Karasunsky	41428,57	1740000,00	42,00	1,00	2,00	1,00
Uralskaya 100	Karasunsky	44000,00	2134000,00	48,50	1,00	2,00	1,00
Uralskaya 100	Karasunsky	43000,00	3461500,00	80,50	2,00	2,00	1,00
Uralskaya 100	Karasunsky	42000,00	3763200,00	89,60	3,00	2,00	1,00
Uralskaya 100	Karasunsky	42000,00	4565400,00	108,70	3,00	2,00	1,00
Aivazovskogo 116	Karasunsky	55609,30	2391200,00	43,00	1,00	10,00	1,00
Aivazovskogo 116	Karasunsky	58333,33	1750000,00	30,00	1,00	7,00	1,00
Aivazovskogo 116	Karasunsky	54000,00	3785400,00	70,10	2,00	5,00	1,00
Sormovskaya 1	Karasunsky	44000,00	1848000,00	42,00	1,00	6,00	0,00
Tamanskaya 159/2	Karasunsky	57894,74	3300000,00	57,00	2,00	1,00	0,00
Altaiskaya 1	Karasunsky	47692,31	3100000,00	65,00	3,00	2,00	0,00
Selezneva 88/1	Karasunsky	53703,70	2900000,00	54,00	1,00	5,00	0,00
Selezneva 100	Karasunsky	46365,91	1850000,00	39,90	1,00	6,00	0,00
Stavropolskaya 173	Karasunsky	58000,00	2900000,00	50,00	2,00	4,00	0,00
Selezneva 2	Karasunsky	56410,26	2200000,00	39,00	1,00	17,00	1,00
Selezneva 4/5	Karasunsky	62857,14	2200000,00	35,00	1,00	4,00	1,00
Selezneva 4/4	Karasunsky	57142,86	2000000,00	35,00	1,00	10,00	1,00
Tulyaeva 129	Karasunsky	66666,67	2200000,00	33,00	1,00	1,00	0,00
Trudovoy Slavy 13	Karasunsky	46857,14	1640000,00	35,00	1,00	7,00	0,00
Ignatova 10	Karasunsky	44444,44	1600000,00	36,00	1,00	6,00	0,00
Nevkipelova 19	Karasunsky	53488,37	2300000,00	43,00	2,00	7,00	0,00
Gidrostroiteley 61	Karasunsky	75510,20	3700000,00	49,00	1,00	12,00	1,00
Taganrogskaya 24	Karasunsky	60000,00	1500000,00	25,00	1,00	2,00	0,00
Novgorodskaya 13	Karasunsky	56521,74	2600000,00	46,00	2,00	2,00	0,00
Starokubanskaya 124	Karasunsky	50106,38	4710000,00	94,00	3,00	8,00	0,00
Uralskaya 115/1	Karasunsky	43055,56	1550000,00	36,00	1,00	4,00	0,00
Simferopolskaya 2/2	Karasunsky	64285,71	4500000,00	70,00	2,00	1,00	0,00
Kubanskaya 45	Karasunsky	50877,19	5800000,00	114,00	3,00	7,00	1,00

Simferopolskaya 30/1	Karasunsky	52857,14	3700000,00	70,00	3,00	2,00	0,00
Sormovskaya 122	Karasunsky	63793,10	7400000,00	116,00	3,00	5,00	1,00
Dimitrova 131	Karasunsky	67741,94	2100000,00	31,00	1,00	1,00	0,00
Stavropolskaya 155/1	Karasunsky	68918,92	2550000,00	37,00	1,00	8,00	1,00
Machugi 46	Karasunsky	56547,62	9500000,00	168,00	4,00	3,00	0,00
Voiskovaя 117	Karasunsky	40645,16	1260000,00	31,00	1,00	2,00	1,00
Voiskovaя 19	Karasunsky	32236,84	1225000,00	38,00	1,00	3,00	0,00
Stanovaя 60	Karasunsky	34615,38	2700000,00	78,00	2,00	2,00	0,00
Blagoveschenskaya 9	Karasunsky	32558,14	7000000,00	215,00	4,00	2,00	0,00
Novorossiiskaya 204	Karasunsky	39189,19	2900000,00	74,00	3,00	2,00	0,00
Pereulok Yushkovskoy 15	Karasunsky	75000,00	4500000,00	60,00	2,00	3,00	0,00
Selezneva 190	Karasunsky	55581,40	2390000,00	43,00	2,00	4,00	0,00
Uralskaya 17	Karasunsky	51111,11	2300000,00	45,00	2,00	5,00	0,00
40 Let Pobedy 2	Central	57575,76	1900000,00	33,00	1,00	2,00	0,00
Kolkhoznaya 67	Central	71428,57	4000000,00	56,00	3,00	2,00	0,00
Kurchatova 2	Central	57575,76	1900000,00	33,00	1,00	2,00	0,00
Kommunarov 239	Central	91666,67	5500000,00	60,00	3,00	2,00	0,00
Kommunarov 239	Central	100000,00	5500000,00	55,00	3,00	1,00	0,00
Kommunarov 237	Central	60810,81	4500000,00	74,00	3,00	2,00	0,00
Krasnaya 202	Central	55555,56	2500000,00	45,00	2,00	3,00	0,00
Kommunarov 286	Central	55833,33	3350000,00	60,00	3,00	2,00	0,00
Gavrilova 103	Central	63888,89	2300000,00	36,00	2,00	5,00	0,00
1 Kolkhozny Projezd 37	Central	64864,86	2400000,00	37,00	2,00	2,00	0,00
Odesskaya 46	Central	62500,00	2500000,00	40,00	2,00	1,00	0,00
Krasnaya 176	Central	129032,26	8000000,00	62,00	2,00	8,00	1,00
Krasnaya 176	Central	76530,61	7500000,00	98,00	3,00	22,00	1,00
Krasnaya 176	Central	73750,00	2950000,00	40,00	1,00	13,00	1,00
Krasnaya 174	Central	58000,00	3161000,00	54,50	2,00	12,00	1,00
Budennogo 221	Central	61428,57	2150000,00	35,00	1,00	2,00	0,00
Severnaya 376	Central	77464,79	5500000,00	71,00	4,00	1,00	0,00
Krasnoarmeiskaya 122	Central	97894,74	9300000,00	95,00	2,00	11,00	1,00
Krasnoarmeiskaya 141	Central	85000,00	8500000,00	100,00	2,00	10,00	1,00
Pashkovskaya 141	Central	56896,55	3300000,00	58,00	3,00	5,00	0,00
Levanevskogo 73	Central	64054,05	2370000,00	37,00	1,00	3,00	0,00
Gorkogo 120	Central	52356,02	1000000,00	19,10	1,00	1,00	0,00
Krasnoarmeiskaya 65	Central	86947,83	9999000,00	115,00	3,00	8,00	1,00
Gogolya 65	Central	66666,67	6000000,00	90,00	3,00	2,00	0,00

Gimnazicheskaya 40	Central	105555,56	9500000,00	90,00	2,00	4,00	1,00
Lenina 70	Central	76923,08	6000000,00	78,00	3,00	1,00	1,00
Sedina 29	Central	49916,67	5990000,00	120,00	4,00	2,00	0,00
Sovetskaya 58	Central	50000,00	2000000,00	40,00	3,00	2,00	0,00
Pushkina 2	Central	90476,19	7600000,00	84,00	1,00	15,00	1,00
Stavropolskaya 3	Central	57000,00	3990000,00	70,00	2,00	4,00	1,00
Kommunarov 260	Central	57567,57	2130000,00	37,00	1,00	14,00	1,00
Moskovskaya 2	Central	70000,00	2170000,00	31,00	1,00	2,00	0,00
Promyshlennaya 33	Central	92941,18	7900000,00	85,00	2,00	10,00	1,00
Filatova 17	Central	55154,64	5350000,00	97,00	3,00	12,00	1,00
Volodarskogo 75	Central	57017,54	3250000,00	57,00	1,00	1,00	0,00
Budennogo 153	Central	63700,00	3822000,00	60,00	1,00	2,00	0,00
Radio 12	Central	54629,63	2950000,00	54,00	3,00	3,00	0,00
Gogolya 142	Central	55000,00	2750000,00	50,00	1,00	8,00	0,00
Gudimy 64/1	Central	63461,54	4950000,00	78,00	3,00	1,00	0,00
Korolenko 3	Central	56451,61	1750000,00	31,00	1,00	3,00	0,00
Ozernaya 11	Central	60263,16	2290000,00	38,00	1,00	3,00	1,00
Chekhova 20	Central	33544,30	2650000,00	79,00	4,00	5,00	0,00
Linejnaya 19	Central	62686,57	4200000,00	67,00	2,00	10,00	1,00
Voronezhskaya 42	Central	46666,67	2100000,00	45,00	2,00	3,00	0,00
Pionerskaya 44	Central	42857,14	6000000,00	140,00	4,00	2,00	0,00
Aivazovskogo 53/1	Central	56274,00	5627400,00	100,00	3,00	15,00	1,00
Starokubanskaya 40	Central	68627,45	3500000,00	51,00	2,00	4,00	0,00
Kubanskaya naberezhnaya 5	Central	45423,73	2680000,00	59,00	2,00	8,00	1,00
Pashkovskaya 83	Central	85106,38	4000000,00	47,00	4,00	4,00	1,00
Dlinnaya 175	Central	106250,00	6800000,00	64,00	3,00	1,00	0,00

Part 2. Spatial characteristics of properties

Address	Distance to city center, km	Distance to the nearest place, km	Distance to the nearest stop, km
Stavropolskaya 18	3,70	1,13	0,35
Stavropolskaya 18	3,70	1,13	0,35
Stavropolskaya 18	3,70	1,13	0,35
Stavropolskaya 18	3,70	1,13	0,35
Minskaya 122/11	3,80	1,40	0,35
Minskaya 122/2	4,10	1,50	0,40
Minskaya 122	3,80	1,40	0,35

Minskaya 59	4,70	0,95	0,16
Minskaya 59	4,70	0,95	0,16
Minskaya 122/13	4,20	1,90	0,35
Kozhevennaya 24	3,60	1,80	0,09
Prospect Chekistov 38	6,80	0,60	0,29
Prospect Chekistov 38	6,80	0,60	0,29
Prospect Chekistov 40	6,90	0,60	0,30
Prospect Chekistov 24	6,50	0,09	0,21
Rozhdestvenskaya Naberezhnaya	6,70	0,40	0,50
Prospect Chekistov 8/4	6,70	0,50	0,55
Prospect Chekistov 8/4	6,70	0,50	0,55
Kozhevennaya 60	3,00	0,65	0,55
Kozhevennaya 54	3,40	1,00	0,09
Kalinina 350/6	2,50	0,85	0,40
Brusova 18	2,70	1,00	0,18
Gertsina 203	4,20	2,40	0,45
Vorovskogo 137	3,60	1,40	0,55
Karla Marxa 79	3,00	2,20	0,40
Karla Marxa 75	2,90	1,90	0,35
Golovatogo 172	2,70	1,70	0,45
Kalinina 350/7	2,50	1,00	0,55
Karla Marxa 14	2,30	0,40	0,45
Koltsevaya 38/1			
Luzana 41	4,90	1,30	0,13
Luzana 41	4,90	1,30	0,13
Koltsevaya 9	4,60	1,00	0,28
Luzana 4	4,50	0,90	0,04
Shosse Neftyannikov 19	3,30	0,09	0,19
Shosse Neftyannikov 9/1	3,00	0,10	0,07
Dzerzhinskogo 35	3,20	0,45	0,70
Bryanskaya 8	3,10	0,85	0,50
Rashpilevskaya 180	2,80	0,60	0,50
Odesskaya 29	2,20	0,14	0,18
Dzerzhinskogo 11/11	3,00	0,60	0,19
Khakurate 2	1,20	0,14	0,45
Rashpilevskaya 127	1,00	0,27	0,35
Budennogo 129	0,50	0,28	0,13
Budennogo 129	0,50	0,28	0,13
Budennogo 129	0,50	0,28	0,13
Budennogo 129	0,50	0,28	0,13
Golovatogo 292/3	0,85	0,30	0,09

Golovatogo 294	0,65	0,11	0,28
Rashpilevskaya 100	1,20	0,22	0,21
Oktyabrskaya 181/2	1,20	0,50	0,01
Oktyabrskaya 181/2	1,20	0,50	0,01
Oktyabrskaya 181/3	1,20	0,40	0,01
Rashpilevskaya 32	2,10	0,03	0,25
Krasnaya 27	2,00	0,02	0,04
Pushkina 14	3,30	0,45	0,30
Pushkina 14	3,30	0,45	0,30
Rechnaya 11	3,70	0,65	0,70
Stankostroitelnaya 18	3,70	0,40	0,65
Sovetskaya 35	2,50	0,16	0,23
Pokryshkina 2/3	8,70	0,90	0,75
Pokryshkina 2/3	8,70	0,90	0,75
Pokryshkina 2/3	8,70	0,90	0,75
Agrohimicheskaya 138/2	10,20	3,80	0,90
Agrohimicheskaya 138/2	10,20	3,80	0,90
Ismailskaya 72	14,10	11,10	0,80
Ismailskaya 73	14,10	11,10	0,80
Ismailskaya 74	14,10	11,10	0,80
Sovkhoznaya 1	5,40	0,16	0,45
Sovkhoznaya 1	5,40	0,16	0,45
Sovkhoznaya 1	5,40	0,16	0,45
Gagarina 111	3,50	1,00	0,17
Atarbekova 1	5,20	0,45	0,35
Repina 5	4,90	2,50	1,00
Simirenko 37	6,10	1,00	1,70
40 Let Pobedy 135	5,40	2,90	0,50
40 Let Pobedy 15	4,20	0,30	0,17
40 Let Pobedy 15	4,20	0,30	0,17
Montazhnikov 1/2	3,70	0,35	0,35
Atarbekova 45	4,50	0,10	0,16
Gavrilova 27/1	2,50	0,75	0,80
Gavrilova 27/1	2,50	0,75	0,80
Gavrilova 27	2,50	0,75	0,80
Kalinina 13	4,60	0,35	0,40
Zapadnaya 2	6,70	1,80	0,55
Lukyaninko 103	7,00	1,50	0,60
Lukyaninko 7/1	6,80	1,00	0,40
Kurgannaya 144	15,00	3,00	1,90
Kovaleva 5	5,50	0,35	0,60

Atarbekova 25	4,80	0,45	0,11
Yana-Poluyana 50	4,90	0,45	0,15
Arkhitektora Ishunina 8	5,10	0,35	0,35
Arkhitektora Ishunina 8	5,10	0,35	0,35
Turgeneva 144	4,70	0,18	0,03
Dalnyaya 4	4,20	0,60	0,50
Turgeneva 191	4,90	0,50	0,12
Turgeneva 219	4,90	0,71	0,55
Dzerzhinskogo 127	4,80	1,30	0,15
Lazurnaya 68	5,60	1,70	0,60
Korenovskaya 39	8,10	0,76	0,40
Dzerzhinskogo 224	8,00	0,40	0,23
Musorgskogo 19	7,90	2,90	1,10
Ussuriiskaya 27	7,60	3,60	1,20
Zipovskaya 42	5,00	1,00	0,45
Vorovskogo 237	4,50	0,40	0,29
Gagarina 158	4,20	1,10	0,11
Cherkasskaya 70	7,10	2,80	0,19
Cherkasskaya 5	6,30	3,30	0,07
Zhloby 135	5,50	0,19	0,07
Peredovая 56	3,30	1,20	0,13
Parusnaya 1	10,70	1,30	1,00
Parusnaya 1	10,70	1,30	1,00
Parusnaya 1	10,70	1,30	1,00
Parusnaya 10	10,50	1,80	1,60
Parusnaya 10	10,50	1,80	1,60
Parusnaya 10	10,50	1,80	1,60
Uralskaya 75	6,20	1,10	0,17
Uralskaya 75	6,20	1,10	0,17
Uralskaya 100	6,60	1,00	0,05
Uralskaya 100	6,60	1,00	0,05
Uralskaya 100	6,60	1,00	0,05
Uralskaya 100	6,60	1,00	0,05
Uralskaya 100	6,60	1,00	0,05
Uralskaya 100	6,60	1,00	0,05
Aivazovskogo 116	8,20	0,15	0,30
Aivazovskogo 116	8,20	0,15	0,30
Aivazovskogo 116	8,20	0,15	0,30
Sormovskaya 1	7,20	0,50	0,45
Tamanskaya 159/2	6,60	1,50	0,55
Altaiskaya 1	6,30	0,20	0,23
Selezneva 88/1	5,60	0,20	0,50
Selezneva 100	5,80	0,70	0,12

Stavropolskaya 173	6,50	0,40	0,75
Selezneva 2	4,50	1,20	1,80
Selezneva 4/5	4,80	0,80	0,41
Selezneva 4/4	4,80	0,80	0,41
Tulyaeva 129	10,30	0,25	0,06
Trudovoy Slavy 13	9,80	1,30	0,30
Ignatova 10	9,50	1,80	0,03
Nevkipelova 19	10,50	0,64	0,30
Gidrostroiteley 61	11,00	1,20	0,40
Taganrogskaya 24	5,40	1,10	0,55
Novgorodskaya 13	5,10	1,60	0,65
Starokubanskaya 124	6,90	1,00	0,90
Uralskaya 115/1	10,00	0,90	0,85
Simferopolskaya 2/2	10,80	0,15	0,80
Kubanskaya 45	7,40	0,65	0,45
Simferopolskaya 30/1	10,00	1,10	0,80
Sormovskaya 122	10,70	0,40	0,77
Dimitrova 131	5,60	0,80	0,50
Stavropolskaya 155/1	5,90	0,15	0,08
Machugi 46	9,70	1,80	0,17
Voiskovaя 117	16,80	6,20	0,70
Voiskovaя 19	18,20	7,70	0,13
Stanovaя 60	17,40	7,20	0,30
Blagoveschenskaya 9	16,60	7,80	1,30
Novorossiiskaya 204	6,60	1,20	0,22
Pereulok Yushkovskoy 15	4,20	0,70	0,40
Selezneva 190	6,90	0,90	0,60
Uralskaya 17	5,10	1,00	0,35
40 Let Pobedy 2	3,90	0,30	0,19
Kolkhoznaya 67	3,60	0,09	0,03
Kurchatova 2	4,00	0,90	0,26
Kommunarov 239	2,80	0,21	0,09
Kommunarov 239	2,80	0,21	0,09
Kommunarov 237	2,70	0,24	0,17
Krasnaya 202	2,80	0,60	0,35
Kommunarov 286	2,50	0,56	0,23
Gavrilova 103	2,50	0,45	0,30
1 Kolkhozny Projezd 37	3,60	0,45	0,35
Odesskaya 46	2,40	0,30	0,06
Krasnaya 176	1,60	0,08	0,12
Krasnaya 176	1,60	0,08	0,12
Krasnaya 176	1,60	0,08	0,12

Krasnaya 174	1,00	0,10	0,25
Budennogo 221	1,40	0,85	0,17
Severnaya 376	0,80	0,40	0,04
Krasnoarmeiskaya 122	0,30	0,18	0,27
Krasnoarmeiskaya 141	1,00	0,20	0,35
Pashkovskaya 141	1,20	1,00	0,26
Levanevskogo 73	1,10	0,90	0,01
Gorkogo 120	0,90	0,90	0,04
Krasnoarmeiskaya 65	0,60	0,24	0,28
Gogolya 65	1,10	0,21	0,21
Gimnazicheskaya 40	1,30	0,17	0,24
Lenina 70	1,80	0,55	0,40
Sedina 29	2,50	1,00	0,35
Sovetskaya 58	2,50	1,00	0,14
Pushkina 2	3,20	0,34	0,50
Stavropolskaya 3	3,20	0,90	0,11
Kommunarov 260	1,20	0,85	0,20
Moskovskaya 2	3,80	1,00	0,80
Promyshlennaya 33	2,30	0,70	0,30
Filatova 17	4,50	1,20	1,00
Volodarskogo 75	2,90	1,10	0,40
Budennogo 153	0,80	0,70	0,10
Radio 12	3,10	0,90	0,45
Gogolya 142	2,00	1,00	0,16
Gudimy 64/1	2,10	0,90	0,35
Korolenko 3	3,00	1,20	0,75
Ozernaya 11	3,70	1,00	0,45
Chekhova 20	3,40	1,60	0,40
Linejnaya 19	3,60	1,20	0,50
Voronezhskaya 42	5,60	2,20	0,28
Pionerskaya 44	5,10	2,00	0,70
Aivazovskogo 53/1	6,40	1,80	0,40
Starokubanskaya 40	7,40	0,80	0,65
Kubanskaya naberezhnaya 5	7,80	1,90	0,80
Pashkovskaya 83	0,70	0,30	0,40
Dlinnaya 175	0,40	0,40	0,40

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111.	http://krasnodar.cian.ru/sale/flat/48085431/

112.	http://cian.ru/sale/flat/47168307

113.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-parusnaya-ul-1-advert533442492.html

114.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/2-komn-kv-parusnaya-ul-1-advert533445134.html

115.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-parusnaya-ul-1-advert532248581.html

116.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-parusnaya-ul-10-advert532235738.html

117.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/2-komn-kv-parusnaya-ul-10-3-18-ploschad-obschaya-advert518954499.html

118.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-parusnaya-ul-10-advert532282981.html

119.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-ural-skaya-ul-advert532274062.html

120.	http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-ural-skaya-ul-advert531893366.html

121.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

122.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

123.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

124.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

125.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

126.	http://www.krasnodar-kvartiri.ru/catalog/zhk-sem-zvezd/

127.   http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-ayvazovskogo-ul-116-advert532622387.html

128.   http://krasnodar.irr.ru/real-estate/apartments-sale/new/1-komn-kv-ayvazovskogo-ul-116-7-19-ploschad-obschaya-advert473680179.html

129.   http://krasnodar.irr.ru/real-estate/apartments-sale/new/2-komn-kv-ayvazovskogo-ul-116-5-19-ploschad-obschaya-advert473611592.html

130.   http://krasnodar.irr.ru/real-estate/apartments-sale/secondary/1-komnatnaya-kmr-42-20-12-advert533548994.html

131.   http://krasnodar.irr.ru/real-estate/apartments-sale/secondary/2-komn-kvartira-tamanskaya-ul-159-2-advert533557106.html

132.   http://krasnodar.irr.ru/real-estate/apartments-sale/secondary/3-komnatnaya-chmr-selezneva-65-38-8-advert533549244.html

133.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_54_m_522_et._713078368

134.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_39.9_m_616_et._703513667

135.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_50_m_45_et._627996101

136.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_39_m_1717_et._723614692

137.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_35_m_49_et._525393745

138.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_35_m_1016_et._537588142

139.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_33_m_19_et._726535226

140.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_35_m_79_et._721740971

141.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_36_m_610_et._714753612

142.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_43_m_712_et._720628767

143.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_49_m_1216_et._717525368

144.   http://krasnodar.cian.ru/sale/flat/48079396/

145.   http://cian.ru/sale/flat/46495322

146.   http://krasnodar.cian.ru/sale/flat/48084756/

147.   http://cian.ru/sale/flat/35494464

148.   http://cian.ru/sale/flat/33221980

149.   http://krasnodar.cian.ru/sale/flat/39505421/

150.   http://krasnodar.cian.ru/sale/flat/47171607/

151.   http://cian.ru/sale/flat/33203242

152.   http://cian.ru/sale/flat/32114692
153.   http://krasnodar.cian.ru/sale/flat/49247541/
154.   http://cian.ru/sale/flat/49353671
155.   http://cian.ru/sale/flat/46664037
156.   http://krasnodar.cian.ru/sale/flat/32707672/
157.   http://krasnodar.cian.ru/sale/flat/41103113/
158.   http://krasnodar.cian.ru/sale/flat/49359656/
159.   http://krasnodar.cian.ru/sale/flat/33213628/
160.   http://krasnodar.cian.ru/sale/flat/49091391/
161.   http://cian.ru/sale/flat/43551509
162.   http://krasnodar.cian.ru/sale/flat/47926227/
163.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_33_m_25_et._717173304
164.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_56_m_25_et._606721656
165.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_33_m_25_et._695988508
166.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_60_m_23_et._701604386
167.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_55_m_13_et._617465002
168.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_74_m_23_et._683915954
169.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_45_m_35_et._725323014
170.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_60_m_25_et._584677053
171.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_36_m_55_et._585037671
172.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_37_m_12_et._455606307
173.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_40_m_12_et._648437271
174.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_62_m_817_et._477186533
175.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_100_m_2224_et._524131140
176.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_40_m_1325_et._673886021
177.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_54.5_m_1216_et._726786341

178.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_35_m_23_et._721167145
179.   https://www.avito.ru/krasnodar/kvartiry/4-k_kvartira_71_m_11_et._145515349
180.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_95_m_1116_et._720876100
181.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_100_m_1016_et._480159251
182.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_58_m_55_et._721774343
183.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_37_m_34_et._715245314
184.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_19.1_m_11_et._724736672
185.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_115_m_811_et._681839759
186.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_95_m_23_et._364437696
187.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_90_m_412_et._174132953
188.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_78_m_15_et._622370637
189.   https://www.avito.ru/krasnodar/kvartiry/4-k_kvartira_120_m_22_et._681074615
190.   https://www.avito.ru/krasnodar/kvartiry/3-k_kvartira_40_m_22_et._715748519
191.   https://www.avito.ru/krasnodar/kvartiry/1-k_kvartira_84_m_215_et._681400347
192.   https://www.avito.ru/krasnodar/kvartiry/2-k_kvartira_70_m_416_et._725157638
193.   http://cian.ru/sale/flat/49032211
194.   http://cian.ru/sale/flat/47168252
195.   http://krasnodar.cian.ru/sale/flat/49374511/
196.   http://cian.ru/sale/flat/49248156
197.   http://krasnodar.cian.ru/sale/flat/35999634/
198.   http://krasnodar.cian.ru/sale/flat/47756732/
199.   http://krasnodar.cian.ru/sale/flat/47584442/
200.   http://cian.ru/sale/flat/47170072
201.   http://krasnodar.cian.ru/sale/flat/46627877/
202.   http://cian.ru/sale/flat/39539099
203.   http://cian.ru/sale/flat/47174422
204.   http://krasnodar.cian.ru/sale/flat/32149390/

205. http://krasnodar.cian.ru/sale/flat/47697647/
206. http://cian.ru/sale/flat/48082086
207. http://krasnodar.cian.ru/sale/flat/49351931/
208. http://cian.ru/sale/flat/48878201
209. http://cian.ru/sale/flat/47645177
210. http://krasnodar.cian.ru/sale/flat/47777812/
211. http://cian.ru/sale/flat/45709457
212. http://cian.ru/sale/flat/49353906

Appendix 2. Data for the econometric model for Prague

Part 1. Physical characteristics of properties

Address	District	Price per square meter	Price of apartment	Property space	No of rooms	Floor	Age
Charvaova	Prague 1	118181,8	9100000	77	2	5	0
Senovazne nam.	Prague 1	87802,2	7990000	91	3	5	0
Na Porici	Prague 1	83333,33	11500000	138	4	3	0
Soukenicka	Prague 1	110000	12496000	113,6	3	4	0
Hellichova	Prague 1	131403,5	7490000	57	2	4	0
U Milosrdných	Prague 1	160344,8	13950000	87	3	3	0
Zlatnicka	Prague 1	113953,5	9800000	86	2	2	0
Masarykovo nábřeží	Prague 1	138946,4	15562000	112	2	6	0
Husova	Prague 1	261333,3	7840000	30	2	1	0
U Lužického semináře	Prague 1	208333,3	40000000	192	4	2	0
V Kolkovne	Prague 1	104698	15600000	149	3	4	0
Staroměstská	Prague 1	199230,8	25900000	130	6	2	0
Karlovo namesti	Prague 1	75317,12	7125000	94,6	3	4	0
Kozi	Prague 1	181326,9	15231462	84	3	6	0
Skolska	Prague 1	89189,19	13200000	148	4	1	0
Karoliny Světlé	Prague 1	106944,4	9625000	90	4	6	0
Bilkova	Prague 1	146078,4	14900000	102	2	3	0
Naprstkova	Prague 1	150602,4	25000000	166	5	5	0
Narodni trida	Prague 1	94190,48	9890000	105	3	3	0
Jungmannovo náměstí	Prague 1	120689,7	14000000	116	3	2	0
Lublanska	Prague 2	66860,47	5750000	86	3	3	0
Anny Letenske	Prague 2	91815,42	9670000	105,32	3	5	0
Belehradska	Prague 2	77777,78	4900000	63	2	3	0
Polska	Prague 2	133600	16700000	125	3	7	0
Wenzigova	Prague 2	72164,95	7000000	97	3	2	0
Belehradska	Prague 2	68879,31	7990000	116	3	3	0
Vratislavova	Prague 2	97988,64	8623000	88	3	6	1

Korunni	Prague 2	120344,8	6980000	58	1	4	0
Záhřebská	Prague 2	87648,08	22788500	260	3	6	0
Gorazdova	Prague 2	82781,46	12500000	151	3	4	0
U Půjčovny	Prague 2	147368,4	11200000	76	1	1	0
Trojicka	Prague 2	97406,59	13149890	135	3	6	0
Rejskova	Prague 2	62250	2490000	40	1	1	0
Voroněžská	Prague 2	78125	7500000	96	3	5	0
Sekaninova	Prague 2	55000	5940000	108	3	3	0
Neklanova	Prague 2	73308,82	4985000	68	2	5	1
Jaromirova	Prague 2	59324,32	4390000	74	3	4	0
Tyrsova	Prague 2	78651,69	7000000	89	4	5	0
Na Poříčním právu	Prague 2	83333,33	10000000	120	4	5	0
Bělehradská	Prague 2	77777,78	4900000	63	2	2	1
Pitterova	Prague 3	72145,55	11500000	159,4	4	5	1
Cimburkova	Prague 3	85476,19	3590000	42	2	4	0
Žižkovo nám.	Prague 3	95798,19	6361000	66,4	3	7	0
Žižkovo nám.	Prague 3	98164,41	8717000	88,8	3	7	0
Štítného	Prague 3	88923,08	5780000	65	2	2	1
Ježkova	Prague 3	71506,33	5649000	79	3	2	0
Žerotínova	Prague 3	80000	4000000	50	2	1	0
Přibyslavská	Prague 3	84965,99	12490000	147	3	6	0
Jeronýmova	Prague 3	76470,59	2600000	34	1	4	0
Kostnické náměstí	Prague 3	74074,07	10000000	135	4	4	1
Olgy Havlove	Prague 3	60196,08	3070000	51	1	3	1
Prokopova	Prague 3	170842,6	16059200	94	3	6	0
Učňovská	Prague 3	70005,61	4990000	71,28	3	2	1
Rohanské nábřeží	Prague 3	68846,15	8950000	130	3	33	0
Nad Ohradou	Prague 3	62903,23	3900000	62	2	4	0
Bořivojova	Prague 3	71673,24	2436890	34	1	4	0
Lucemburská	Prague 3	85294,12	7250000	85	3	4	0
Jičínská	Prague 3	91254,24	10768000	118	4	4	1
Řehořova	Prague 3	92427,75	15990000	173	3	3	0
Nitranská	Prague 3	102325,6	22000000	215	5	3	0
Vikova	Prague 4	47169,81	3250000	68,9	3	6	0
Kvetna	Prague 4	55482,17	4200000	75,7	2	4	0
Hradeckých	Prague 4	45923,73	5419000	118	3	3	0
Hradeckých	Prague 4	47834,48	6936000	145	4	3	0
Kunratice	Prague 4	44059,41	8900000	202	5	1	1
Branicka	Prague 4	89595,74	8422000	94	2	2	0
Podolske schody	Prague 4	91734,69	8990000	98	2	4	0
Hodoninska	Prague 4	54000	2376000	44	1	4	0
Mečislavova	Prague 4	67320,75	3568000	53	1	4	0
Žateckých	Prague 4	56000	5880000	105	3	1	0

Podolské schody	Prague 4	90816,33	8900000	98	2	3	0
Plamínkové	Prague 4	55147,06	3750000	68	3	7	0
V rovinách	Prague 4	135000	13500000	100	2	3	1
Na Formance	Prague 4	50871,56	5545000	109	2	2	1
Novodvorská	Prague 4	43589,74	3400000	78	2	8	0
Pejevové	Prague 4	42307,69	3300000	78	2	3	0
Leopoldova	Prague 4	40468,75	2590000	64	2	3	0
Pod sokolovnou	Prague 4	60101,01	5950000	99	3	6	0
Na Veselí	Prague 4	47560,98	1950000	41	2	3	0
Vlastislavova	Prague 4	57735,85	3060000	53	2	3	0
Míšovická	Prague 5	73870,97	2290000	31	1	7	0
Zborovská	Prague 5	94615,38	15990000	169	3	5	0
Kakosova	Prague 5	72358,49	3835000	53	2	4	0
Kovářova	Prague 5	41300	9499000	230	4	2	1
Zázvorkova	Prague 5	38421,05	3650000	95	3	3	0
Plzeňská	Prague 5	41395,35	8900000	215	4	11	0
Karla Kryla	Prague 5	60000	2700000	45	1	5	1
Pechlatova	Prague 5	63157,89	7200000	114	3	2	0
Petržílkova	Prague 5	46788,99	5100000	109	3	1	0
U Sladovny	Prague 5	59090,91	6500000	110	3	2	1
Silurská	Prague 5	68538,46	3564000	52	3	5	1
Mrkosova	Prague 5	68253,97	4300000	63	2	2	0
Míšovická	Prague 5	73870,97	2290000	31	1	5	0
U svahu	Prague 5	54006,47	5022602	93	2	3	1
Holečkova	Prague 5	78718,31	5589000	71	2	1	1
Petřínská	Prague 5	83166,67	9980000	120	1	5	0
Suchý vršek	Prague 5	46153,85	3600000	78	3	2	0
Vidoulská	Prague 5	56209,29	5350000	95,18	2	4	1
Symfonická	Prague 5	75533,33	3399000	45	2	2	0
Karla Engliše	Prague 5	129800	6490000	50	1	1	0
Břevnovská	Prague 6	86407,77	8900000	103	3	4	0
Pod novým lesem	Prague 6	53577,24	6590000	123	3	1	0
N.A.Někrasova	Prague 6	58846,15	7650000	130	4	5	0
Na Viničce	Prague 6	78819,44	11350000	144	4	4	0
Vlastina	Prague 6	69534,88	2990000	43	1	11	0
Patanka	Prague 6	83669,76	6944590	83	2	4	0
Máslova	Prague 6	85097,94	5786660	68	1	3	0
Lysolajské údolí	Prague 6	67477,48	7490000	111	3	1	1
Mařákova	Prague 6	96666,67	7250000	75	1	2	0
Tychonova	Prague 6	195000	19500000	100	2	1	0
Evropská	Prague 6	57476,19	3621000	63	2	7	0
Irská ulice	Prague 6	70234,38	8990000	128	4	6	0
Vlastina	Prague 6	68577,98	2990000	43,6	2	10	0

Rooseveltova	Prague 6	91428,57	6400000	70	2	4	0
Šlejnická	Prague 6	53807,69	6995000	130	4	1	0
Roztocka	Prague 6	72545,45	3990000	55	2	1	0
Nikoly Tesly	Prague 6	91328,13	11690000	128	4	4	0
Wuchterlova	Prague 6	95678,57	8037000	84	3	2	0
Špotzova	Prague 6	52615,38	3420000	65	3	1	0
Bolívarova	Prague 6	68085,11	6400000	94	3	2	0
Na Maninách	Prague 7	86666,67	5200000	60	2	7	0
Veletržní ulice	Prague 7	76058,2	5750000	75,6	3	5	0
V přístavu	Prague 7	66875	7490000	112	3	2	1
Letenské náměstí	Prague 7	74528,3	3950000	53	2	3	0
Strojnická ulice	Prague 7	51729,32	6880000	133	5	1	0
ulice Komunardů	Prague 7	88970,87	8790322	98,8	3	6	0
Strojnická ulice	Prague 7	63478,26	7300000	115	4	3	0
ulice Komunardů	Prague 7	95069,72	9545000	100,4	3	7	0
Kostelní	Prague 7	85193,8	10990000	129	3	4	0
Vrbenského	Prague 7	52127,66	4900000	94	2	4	0
Dobrovského	Prague 7	87155,96	9500000	109	2	5	0
Ovenecká	Prague 7	105405,4	7800000	74	1	5	0
Dělnická	Prague 7	51046,51	4390000	86	2	2	0
Poupětova	Prague 7	82666,67	6200000	75	2	2	0
Heřmanova	Prague 7	63529,41	5400000	85	1	5	0
Milady Horákové	Prague 7	69234,69	6785000	98	2	3	0
Veletržní	Prague 7	82394,37	5850000	71	3	4	0
Františka Křížka	Prague 7	122222,2	5500000	45	1	6	0
Šmeralova	Prague 7	90000	12600000	140	5	2	0
Janovského	Prague 7	56704,55	4990000	88	3	2	0
V zahradách	Prague 8	32033,9	1890000	59	2	3	0
Nad Okrouhlíkem	Prague 8	71304,35	8200000	115	4	2	0
Společná	Prague 8	54822,34	10800000	197	6	4	0
U Třešňovky	Prague 8	63264,9	9553000	151	4	2	0
Nad Okrouhlíkem	Prague 8	77272,73	8500000	110	2	2	1
Libeňský ostrov	Prague 8	100227,3	6615000	66	1	3	1
Pernerova	Prague 8	78947,37	7500000	95	2	3	0
Pivovarnická	Prague 8	47952,38	3021000	63	1	6	0
Rohanské nábřeží	Prague 8	145070,4	20600000	142	2	5	0
Březinova	Prague 8	54686,96	6289000	115	3	5	0
Čertův Vršek	Prague 8	51000	2550000	50	1	0	0
Trojská	Prague 8	92567,57	6850000	74	2	1	0
Třeboradická	Prague 8	93023,26	12000000	129	3	2	0
Chaberská	Prague 8	67701,15	5890000	87	3	2	0
Služská	Prague 8	42413,79	3690000	87	3	3	0
Vřesová	Prague 8	52272,73	6900000	132	3	0	0

K Haltýři	Prague 8	55645,16	3450000	62	2	1	0
Hackerova	Prague 8	44375	3550000	80	3	6	0
Vršní	Prague 8	54393,94	3590000	66	6	2	0
Kubova	Prague 8	61818,18	3400000	55	2	4	0
Nademlejnská	Prague 9	77553,19	7290000	94	4	3	1
Desenská	Prague 9	32424,24	7490000	231	4	3	1
Nademlejnská	Prague 9	77553,19	7290000	94	3	3	1
Tlustého	Prague 9	40000	3120000	78	3	3	0
Místecká	Prague 9	53000	3180000	60	2	7	0
Makedonská	Prague 9	57988,41	3363328	58	2	1	1
Pavla Beneše	Prague 9	58441,56	4500000	77	3	1	0
Pod Harfou	Prague 9	55925,67	6039972	108	4	2	1
Litoměřická	Prague 9	60625	3395000	56	1	0	0
Poštovská	Prague 9	48057,69	2499000	52	2	1	0
U Vysočanského pivovaru	Prague 9	44827,59	2600000	58	2	2	0
Nemocniční	Prague 9	43736,11	3149000	72	2	5	0
Jana Přibíka	Prague 9	52439,02	4300000	82	3	4	0
Freyova	Prague 9	84905,66	4500000	53	2	2	0
Kovářská	Prague 9	74000	3700000	50	2	2	0
Českomoravská	Prague 9	70312,48	4499999	64	2	6	0
Poděbradská	Prague 9	63716,41	6371641	100	4	4	1
Na Harfě	Prague 9	56964,29	7975000	140	4	6	0
Libočanská	Prague 9	73578,95	6990000	95	4	2	0
Malkovského	Prague 9	44520,55	3250000	73	3	5	0
Konojedská	Prague 10	59243,4	8300000	140,1	4	5	0
Nad přehradou	Prague 10	66388,89	2390000	36	1	0	0
Pečárková	Prague 10	58627,45	2990000	51	2	4	1
Vršovická	Prague 10	77272,73	8500000	110	3	3	0
Kodaňská	Prague 10	90701,22	11900000	131,2	4	3	0
Kryšpínova	Prague 10	49718,83	5916541	119	4	7	1
Hornoměcholupská	Prague 10	48660	2433000	50	1	4	0
Bratislavská	Prague 10	28269,89	4975500	176	2	6	1
Záběhlická	Prague 10	67600	1690000	25	1	2	0
Žitomírská	Prague 10	63157,89	3600000	57	1	2	0
Ellnerové	Prague 10	42058,82	4290000	102	3	7	0
Ungarova	Prague 10	75694,44	5450000	72	2	5	0
Jahodová	Prague 10	69166,67	4150000	60	1	0	0
Donatellova	Prague 10	56363,64	3100000	55	3	2	0
Novostrašnická	Prague 10	70000	4900000	70	2	2	0
Krátká	Prague 10	47967,48	5900000	123	5	1	0
Nad Primaskou	Prague 10	57017,54	3250000	57	3	2	0
Ruská	Prague 10	63140,35	3599000	57	3	3	0

Oblouková	Prague 10	73863,64	6500000	88	4	5	0
K Vodě	Prague 10	66738,04	8942897	134	3	1	1

Part 2. Spatial characteristics of properties

Address	Distance to city center, km	Distance to the nearest place, km	Distance to the nearest stop, km
Charvaova	0,95	0,25	1,40
Senovazne nam.	1,10	0,56	0,11
Na Porici	1,20	0,49	0,17
Soukenicka	0,85	0,35	0,19
Hellichova	1,70	0,12	0,07
U Milosrdných	0,55	0,10	0,45
Zlatnicka	1,10	0,40	0,35
Masarykovo nábřeží	1,40	0,28	0,35
Husova	0,45	0,09	0,23
U Lužického semináře	1,20	0,12	0,29
V Kolkovne	0,60	0,47	0,22
Staroměstská	0,09	0,09	0,35
Karlovo namesti	1,40	0,12	0,20
Kozi	0,40	0,19	0,21
Skolska	1,30	0,40	0,40
Karoliny Světlé	0,90	0,35	0,19
Bilkova	0,40	0,30	0,27
Naprstkova	0,75	0,21	0,15
Narodni trida	0,80	0,20	0,40
Jungmannovo náměstí	0,60	0,14	0,10
Lublanska	2,30	0,70	0,60
Anny Letenske	1,90	0,26	0,35
Belehradska	3,40	0,40	0,08
Polska	2,10	0,08	0,55
Wenzigova	2,30	0,55	0,16
Belehradska	3,40	0,60	0,08
Vratislavova	2,70	0,20	0,45
Korunni	2,30	0,09	0,07
Záhřebská	2,50	0,44	0,45
Gorazdova	1,90	0,45	0,13
U Půjčovny	1,10	0,10	0,30
Trojicka	2,20	0,25	0,35
Rejskova	2,90	1,00	0,50

Voroněžská	2,90	0,21	0,70
Sekaninova	3,10	0,67	0,23
Neklanova	2,70	0,26	0,45
Jaromirova	3,00	1,00	0,03
Tyrsova	2,10	0,39	0,28
Na Poříčním právu	2,10	0,16	0,30
Bělehradská	3,40	0,35	0,10
Pitterova	3,7	0,8	0,19
Cimburkova	2,3	0,41	0,45
Žižkovo nám.	2,9	0,15	0,25
Žižkovo nám.	2,9	0,15	0,25
Štítného	2,4	0,37	0,29
Ježkova	2,3	0,25	0,55
Žerotínova	3,2	0,35	0,25
Přibyslavská	2,2	0,35	0,2
Jeronýmova	2,2	0,4	0,4
Kostnické náměstí	2,3	0,41	0,35
Olgy Havlove	6,6	0,75	0,45
Prokopova	4,2	0,15	0,19
Učňovská	8,3	0,97	0,27
Rohanské nábřeží	3	0,16	0,45
Nad Ohradou	5,9	1	0,14
Bořivojova	2,3	0,19	0,35
Lucemburská	3,1	0,29	0,26
Jičínská	3,6	0,17	0,14
Řehořova	1,8	0,3	0,6
Nitranská	2,9	0,17	0,1
Vikova	6,00	0,60	0,20
Kvetna	4,60	0,30	0,35
Hradeckých	3,80	0,20	0,27
Hradeckých	3,80	0,20	0,27
Kunratice	10,60	0,45	0,45
Branicka	7,10	0,80	0,07
Podolske schody	3,60	0,21	0,26
Hodoninska	6,20	0,60	0,65
Mečislavova	3,70	0,27	0,35
Žateckých	3,90	0,30	0,25
Podolské schody	3,60	0,21	0,26
Plamínkové	4,60	0,37	0,60
V rovinách	5,70	0,42	0,50
Na Formance	12,40	0,50	0,45
Novodvorská	8,90	0,80	0,60
Pejevové	10,80	0,80	0,50

Leopoldova	9,80	0,85	0,26
Pod sokolovnou	3,90	0,20	0,15
Na Veselí	4,50	0,36	0,20
Vlastislavova	3,60	0,30	0,26
Míšovická	11,30	0,30	0,45
Zborovská	2,20	0,19	0,18
Kakosova	10,40	0,60	0,28
Kovářova	10,30	0,50	0,40
Zázvorkova	9,30	0,45	0,40
Plzeňská	3,80	0,35	0,18
Karla Kryla	10,00	0,30	0,30
Pechlatova	4,80	0,40	0,16
Petržílkova	8,10	0,65	0,21
U Sladovny	12,70	0,29	0,55
Silurská	8,00	0,29	0,45
Mrkosova	10,90	0,20	0,70
Míšovická	11,50	0,39	1,00
U svahu	11,40	0,85	0,50
Holečkova	3,50	0,20	0,08
Petřínská	1,80	0,20	0,24
Suchý vršek	8,20	0,60	0,35
Vidoulská	7,50	0,80	0,65
Symfonická	9,20	0,18	0,30
Karla Engliše	3,20	0,18	0,21
Břevnovská	4,40	0,14	0,15
Pod novým lesem	4,90	0,70	0,45
N.A.Někrasova	3,00	0,10	0,35
Na Viničce	4,30	0,40	0,13
Vlastina	8,20	0,50	0,12
Patanka	4,30	0,26	0,60
Máslova	4,00	0,30	0,25
Lysolajské údolí	6,20	0,68	0,35
Mařákova	2,10	0,15	0,24
Tychonova	1,90	0,04	0,23
Evropská	6,20	0,45	0,15
Irská ulice	5,80	0,31	0,45
Vlastina	8,20	0,50	0,75
Rooseveltova	2,70	0,24	0,45
Šlejnická	3,80	0,55	0,30
Roztocka	6,20	0,35	0,14
Nikoly Tesly	3,30	0,14	0,17
Wuchterlova	2,60	0,21	0,14
Špotzova	7,80	0,30	0,25

Bolívarova	6,50	0,60	0,35
Na Maninách	3,50	0,50	0,11
Veletržní ulice	2,10	0,55	0,29
V přístavu	4,10	0,55	0,75
Letenské náměstí	1,80	0,19	0,22
Strojnická ulice	2,40	0,45	0,08
ulice Komunardů	2,90	0,28	0,15
Strojnická ulice	2,40	0,45	0,08
ulice Komunardů	2,90	0,28	0,15
Kostelní	1,50	0,10	0,50
Vrbenského	4,40	0,55	0,35
Dobrovského	1,80	0,21	0,15
Ovenecká	1,90	0,20	0,12
Dělnická	3,30	0,34	0,20
Poupětova	3,50	0,23	0,21
Heřmanova	2,00	0,35	0,29
Milady Horákové	1,60	0,29	0,30
Veletržní	2,00	0,16	0,21
Františka Křížka	1,70	0,18	0,12
Šmeralova	1,90	0,23	0,17
Janovského	2,20	0,40	0,19
V zahradách	5,80	0,45	0,40
Nad Okrouhlíkem	6,60	0,35	0,45
Společná	7,30	0,60	0,50
U Třešňovky	5,80	0,35	0,13
Nad Okrouhlíkem	6,60	0,35	0,45
Libeňský ostrov	4,40	0,10	0,50
Pernerova	2,40	0,30	0,50
Pivovarnická	5,20	0,45	0,40
Rohanské nábřeží	2,20	0,10	0,20
Březinova	2,80	0,21	0,30
Čertův Vršek	6,40	0,75	0,45
Trojská	5,60	0,23	0,12
Třeboradická	6,30	0,40	0,45
Chaberská	6,30	0,50	0,18
Služská	5,90	0,60	0,21
Vřesová	5,90	0,28	0,35
K Haltýři	5,90	0,30	0,60
Hackerova	6,90	0,55	0,48
Vršní	6,00	0,41	0,30
Kubova	3,10	0,30	0,55
Nademlejnská	8,00	0,30	0,28
Desenská	8,90	1,10	0,65

Nademlejnská	8,00	0,30	0,28
Tlustého	15,90	0,60	0,18
Místecká	10,60	0,50	0,30
Makedonská	8,50	0,65	0,24
Pavla Beneše	10,50	0,80	0,75
Pod Harfou	7,30	1,00	0,19
Litoměřická	7,20	0,45	0,15
Poštovská	7,10	0,60	0,12
U Vysočanského pivovaru	7,00	0,60	0,55
Nemocniční	7,10	0,40	0,26
Jana Přibíka	7,50	0,45	0,30
Freyova	6,60	0,35	0,40
Kovářská	5,70	0,35	0,14
Českomoravská	5,70	0,20	0,09
Poděbradská	7,10	0,65	0,23
Na Harfě	6,50	0,65	0,35
Libočanská	7,30	0,40	0,23
Malkovského	10,60	0,60	0,27
Konojedská	7,60	0,50	0,50
Nad přehradou	12,00	0,30	0,24
Pečárková	16,30	0,35	0,25
Vršovická	4,10	0,20	0,12
Kodaňská	3,90	0,11	0,12
Kryšpínova	10,60	0,80	0,30
Hornoměcholupská	10,70	0,65	0,40
Bratislavská	10,10	0,70	0,21
Záběhlická	6,90	0,30	0,19
Žitomírská	3,80	0,15	0,22
Ellnerové	7,90	0,35	0,35
Ungarova	7,30	0,30	0,27
Jahodová	8,20	0,20	0,26
Donatellova	7,30	0,45	0,35
Novostrašnická	7,10	0,40	0,35
Krátká	5,60	0,10	0,30
Nad Primaskou	5,50	0,15	0,24
Ruská	3,20	0,13	0,70
Oblouková	3,80	0,24	0,06
K Vodě	7,00	0,10	0,30

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