INFLUENCE OF THE CENTRAL CITY ON THE LOCATION OF COMMERCIAL BUILDINGS IN THE AGGLOMERATION. THE EXAMPLE OF KRAKOW, POLAND

Ewa Dębińska ^{a,*}, Joanna A. Palubska ^a

^a AGH University of Science and Technology, Faculty of Mining Surveying and Environmental Engineering, al. A. Mickiewicza 30, 30-059 Krakow, Poland, E-mails: [*Ewa.Debinska@agh.edu.pl](mailto:Ewa.Debinska@agh.edu.pl), palubska@agh.edu.pl

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ABSTRACT:

Shaping the spatial policy belongs to the tasks of the local commune governments, which through the acts of local law in the form of local spatial development plans establish rules of land development for specific purposes. Analyzing properties which are not significantly diversified in terms of location, because they belong to the same area of the "local market", it can be concluded that linking land properties with the functions they can perform and with their development possibilities is the most significant attribute which shapes the level of land value. Suburbanization processes influence the decisions of communes located in the immediate vicinity of urban agglomerations as to the directions of allocating land for specific purposes, especially in the areas within the city's range of influence. The subject of the research is real estates with commercial, service and industrial functions located in the district of Krakow, within the boundaries of communes directly adjacent to Krakow. The aim of the works is to analyze the links between the location of areas designated for commercial development and the location of main communication routes and the distance from the city borders.

1. INTRODUCTION

The rules of shaping the spatial policy were regulated by the Act of 27 March 2003 on spatial planning and development (The Act, 2003) and other legal acts. They are the source of equipping municipalities with one of the most important instruments determining the conditions of land development and development in the form of a local spatial development plan. It is an act of local law, which defines the rules of assigning land for specific purposes, and most importantly, shapes the manner of exercising the ownership right. Adoption of the local plan results in changes, primarily in the economic, social, environmental and legal spheres. The Supreme Audit Office (2016), in its published report, indicates that the entire system of spatial planning and development should provide tools to ensure rational management of space. However, there is a lack of efficiency and effectiveness of this system, which results in disintegration of space or uncontrolled urbanization in the form of the so-called "urban sprawl" into suburban areas. One of the economic effects of adopting a local plan is the impact of its findings on the value of the property, which is the result of the influence of different market attributes of the property and the main factor is location. However, in the database of properties located within the same local market, a feature that becomes equally important in creating value is the

land use. The strategy of local authorities in the field of land use should take into account the needs of the local community, but also the characteristics of the properties covered by the planning activities.

As Gorzym - Wilkowski (2016) describes, the impact of spatial planning on the value of the property, but also on the local social and economic space is effective, producing both positive and negative consequences. In the case of areas with commercial, service and industrial functions, the key role is played by the location in relation to major traffic routes and the distance from the city borders. The proper combination of the land's function with the accompanying land features leads to optimization of the property's value. The assignment of the residential function to areas in high investment zones located along main roads contributes to a decrease in the value of the land, which in these situations is not oriented towards optimal use. One of the possibilities to neutralize the negative influence of traffic routes is to try to change the way the property is used, using the vicinity of traffic routes to increase its attractiveness. The aim of this paper is to analyze the spatial policy of the neighbouring municipalities of the city of Krakow in the district of Krakow in terms of the principles of location of areas with commercial, service and industrial functions in relation to the course of main roads and the distance from the borders of

* Corresponding author: Ewa Dębińska. Ph.D. AGH University of Science and Technology, Faculty of Mining Surveying and Environmental Engineering, al. A. Mickiewicza 30, 30-059 Krakow, Poland, E-mail: Ewa.Debinska@agh.edu.pl.

Krakow. The way in which a given property may be used is the dominant attribute shaping the value of the land.

The value of such properties should be taken into account in the criteria of their optimal use, adjusted to their location and neighbourhood. A change in the manner of use should be considered, which will take into account the potential of the property resulting from, on the one hand, the location along the main road, and, on the other hand, the actions taken by the authorities in shaping the local spatial policy.

2. INFLUENCE OF LOCATION ON PROPERTY VALUE

The first attribute considered is the category of road at which the commercial or industrial property under consideration is located, as one of the main factors taken into account by investors when choosing commercial property.

Commercial use of land is connected with other uses such as communication network, in terms of mobility of goods and people (Rodrigue, 2020). The influence of the location of the main communication routes on the neighbouring areas includes a number of aspects, including physical, socio-economic and environmental factors. All these elements influence more or less the value of properties adjacent to the road or in the zone of its impact. The Carey et al. (2001) study shows that these issues can be considered on two levels:

- road users and
- residents, owners of areas covered by the road's impact zone and companies operating in the area.

The first group of road users assesses the development of the communication network in terms of shortening travel time, travel costs and reducing the number of car accidents. This, in turn, influences the development of existing and potential residential areas, as the main stimulus in the choice of property location is the analysis of time and costs of commuting to work and social and service infrastructure.

Whereas people who are affected by the location of the main communication routes evaluate the impact of this type of investment through the prism:

- deterioration of living conditions caused by traffic noise, environmental pollution resulting from exhaust emissions or unfavorable changes in view,
- the impact of the above factors on the change in the value of the property, especially the housing function.

Negative effects of the main communication routes contribute to the decrease in the value of land with residential functions, which are located directly in the vicinity of a road lane or within the range of its adverse effects in the form of noise and pollution. This strong correlation between the value or price of residential real estate and its location in close proximity to main roads is visible in the situation when new road construction investments are commenced, after the decision on the location of the road investment is made. In case of residential real estate, this dependence on prices is negative, as opposed to other functions, such as commercial, industrial or even agricultural land, where new road investments may increase land prices.

The research indicates a significant impact of noise generated by increased traffic on property prices. Above a certain limit noise level, usually 50 dB, prices start to react negatively to every 1 dB increase in unpleasant sound. The size of the price drop in a given market depends on the road class and the type of the analyzed real estate market. The results presented in the literature are expressed in NDI (noise depreciation indices), expressing the decrease in the value of real estate in relation to a unit increase in noise intensity. The impact of road noise on property prices recorded by Navrud (2002) ranges from 0.08% to 2.22%.

Batman (2001) points out that the vicinity of the road also changes the view. Prices of real estate with a direct view of the road are lower than for similar levels of street noise, but with a different view than the route and car traffic.

This is the second, next to noise, basic variable shaping the prices of properties located by the roads. However, Wilhelmsson (2000) conducted a study which shows that the differences in prices of properties exposed to noise and with different road view attributes are not statistically significant.

It should be noted that not always the presence of noise as well as unfavourable features of the views will be fully reflected in the trading price level. Such a situation may occur if the buyer has much less knowledge about the impact of the above factors than the seller.

The directions of planning activities carried out by local authorities should take into account the interests of the inhabitants of communes, aiming at avoiding deterioration of the usable value of their properties, which as a result of road investments may contribute to a decrease in their market value. Therefore, it is very important to maximize the value of the land through the prism of optimal land use. Such actions are preceded by economic, environmental and social analyses. Along the main roads, there are not only large buildings, but also residential buildings, mainly in the multifunctional area, including both residential and commercial premises. Properties of this type are very susceptible to the influence of the neighbourhood of the main communication routes, which is reflected in their sales prices, which are much lower than comparable properties located outside the area of influence of the road. Moreover, residential properties located in this way are rarely traded. The majority of buyers are willing to pay for the price of the property for the favourable environment and, above all, for better quality of life. Negative price dependence on the location on the main road can be seen primarily in the case of properties built with single-family houses, and for multi-family residential buildings, as with most commercial properties, the positive correlation between the two parameters is observed.

Thus, the location of a high-traffic road is the main factor contributing to the price of the property, the amount of which the buyer depends on the condition of the property, including its surroundings and neighbourhood. Thus, the price of a property located by an existing road already includes a decrease of this value in case of a residential property.

The discussed topic is closely related to the issue of suburbanization and the process of the spill of the city and urbanized area resulting in changes in the land use structure (Żelechowski, 2015). Development (Harasimowicz, 2018) of

trade and service functions in suburban areas is an effect of suburbanization. First of all, along the main roads, dispersed housing development appears. Then it is complemented by facilities and tracks with retail and service functions.

Apart from the location in relation to main communication routes, an important parameter for areas with commercial and industrial functions is the distance from the city borders.

Sorensen (2016) points out that the concentration of service and industrial development takes place in suburban areas (periurban areas), i.e. areas located between the city border and rural agricultural areas, where there is basically only residential development and a change in land use is visible. With economic development (Brezdeń, 2017), ongoing urbanization processes and population growth, the demand for real estate in the suburban zone increases and the supply decreases, which is manifested, among other things, by the concentration of service activities in the centers of urban agglomerations with the simultaneous location of terrain-intensive businesses in the suburbs, where land prices are much lower.

The spatial policy of the local authorities is based on using the potential of land located close to the city border and characterized by very good transport accessibility. The most optimal is the location for retail and service development of large areas forming a compact complex of interconnected commercial facilities with accompanying infrastructure. The effect of the implementation of the assumed spatial policy is first of all a significant share of tax revenues from the discussed real estate in the commune budgets.

3. OPTIMAL LAND USE

The value of a property on a given market results from its physical, economic and institutional-legal characteristics (Kucharska – Stasiak, 2007), but most of all it is shaped by the type of rights connected with the property and its purpose. The purpose of the real estate is determined (The Act, 2003) (The Act, 1997) on the basis of the local zoning plan, and in case of its absence - the study of conditions and directions of zoning or the decision on zoning conditions.

Properties located in the vicinity of main communication routes are an example of adjusting the manner of land use to the existing environmental conditions in order to optimize the use of the property in relation to its value.

Due to the strong dependence of the property's value on the neighbourhood and the impossibility to change this state by changing the location of the property, as these are immovable things, the concept of optimal use of the property should be considered.

Żrobek (2011) points out that the concept of the best and greatest use of real estate is a fundamental and integral part of estimating market value. Determining (Reniger- Biłozor et al., 2017) the optimal use of a property is a key aspect in defining the potential of both the land and the buildings located on it. Determining the optimal use of the property requires considering different forms of property use, but taking into account:

- physical characteristics of the property and legal conditions, combined with the real possibility of using the property as intended,
- economic parameters leading to the decision whether the intended use is economically viable,
- existing demand for a given type of property,
- the value of the property, which should be the highest with the assumption of optimal use of the property.

Consideration of the optimal use of residential properties located in the vicinity of the main communication routes results primarily from limitations in the possibilities of their development and the adverse impact of the road.

You can count here:

- local plan arrangements, indicating an indicative range of significant impact on the traffic environment. In these areas, technical measures were introduced at the location of the facilities, the obligation to apply technical measures to ensure compliance with the standards of protection against noise inside buildings intended for permanent or temporary stay of people. In addition, the distance of the objects under construction from the national road should not be less than 10 m,
- impact of road noise,
- change of scenic qualities
- air pollution by fumes.

Real estate users often instinctively adjust their usage to the characteristics of the location. In relation to properties with residential buildings, it will be more optimal to use a change of function from residential to income generating, most often used as:

- retail and service facilities,
- office buildings,
- tourist services, including catering and accommodation facilities,
- public buildings such as clinics, kindergartens, post office.

The change of use from residential to commercial allows to protect the value of the property against a fall caused by the route. In addition, the proximity of a busy road can affect the higher level of income a company can earn, as it is automatically associated with better transport access, a larger number of potential customers and the desired neighborhood of commercial properties as well.

The optimal way of use also applies to undeveloped areas, especially those intended for single-family housing development, where in the local plan the established principles of development indicate two possibilities in terms of development conditions and standards:

- single-family detached residential buildings,
- residential buildings in detached houses.

Prices of such land, which:

- are located in towns near the border with the city,
- they are characterized by very good accessibility due to the proximity of the national Road,
- are covered by the suburban communication infrastructure, are much higher than the areas comparable in terms of destination and attributes, but located in those parts of the commune for which the travel time is longer, not only because of the distance, but also because they create road congestion,

due to the growing migration of the population to suburban areas.

Therefore, investors, mainly development companies, using the described factors and existing planning conditions, purchase land for semi-detached houses and not for single-family houses. This type of activity is characterized by higher profit and higher demand, which is created mainly by families moving from the city to suburban areas. Semi-detached houses are then treated as an alternative to dwellings in the agglomeration.

In the case of undeveloped areas with a residential and commercial function, where, in accordance with the local law, residential and commercial construction is envisaged, the optimum use of the real estate, and thus the development will be the implementation of commercial and public utility facilities, which will ensure not only higher land sales prices, but also greater benefits from such land development in the form of profits from business activity on the real estate. Individual investors looking for land for single-family houses are not willing to buy this type of land at much higher prices, in exchange for a location by the national road, which in case of this type of construction negatively affects their attractiveness. In housing estates, plots of land located outside the main communication routes are selected.

Therefore, the land development acceptable in practice is still verified by the profitability of use and the resulting value of the property.

4. SUBJECT OF RESEARCH AND THE RESULTS

The subject of the research are real estates from the area of neighboring communes of the city of Krakow, Krakow district, having a commercial-service or industrial function, presented in Figure 1.

Figure 1. Municipalities of Krakow County included in the analysis

The analyzed areas have a number of features that have a significant impact on the level of real estate value, such as:

- direct vicinity of Krakow, one of the largest urban agglomerations in Poland,
- daily, labor-related migrations of people from neighboring municipalities to the city,
- growing demand for residential properties,
- growing demand for commercial real estate, especially in towns near the city border,
- development of technical infrastructure,

- decreasing supply of attractive investment areas not built up in Krakow.

The analyzed municipalities are:

- urban-rural communes: Skawina (but excluding Skawina city), Świątniki Górne,
- rural communes: Igołomia-Wawrzyszew, Kocmyrzów-Luborzyca, Liszki, Michałowice, Mogilany, Wielka Wies, Zabierzów, Zielonki.

The survey does not include land defined as service areas for public purposes, i.e. administration, education, sport.

All the surveyed communes, except for the Skawina commune, are covered by the current local zoning plans, hence the manner of development of individual properties is strictly defined. The subject of the research is land with commercial and industrial service functions. In the communes of the County Office in Krakow (County Office in Krakow, 2018) the following zones of economic activity operate - investment areas (based on information from the communes):

- county Michałowice: service development areas of 2.5 ha, including public services - 0.4 ha, and technical and production buildings - 0.3 ha,
- Mogilany: areas specified in local plans,
- Liszki: according to the study for production and service purposes (including sports and tourism services) - about 430 ha (areas located mainly in Mnikow, Morawica, Kryspinow, Cholerzyn and partly in Piekary),
- Iwanowice: investment areas: Zalesie, Poskwitow, Domiarki, Przystansko and Wladyslaw with a total area of 77.6 ha,
- Skawina: about 290 ha the town of Skawina,
- Kocmyrzów-Luborzyca: about 91 ha,
- Wielka Wies commune: about 3% of the area covered by service investments.

There are 8 national roads and 7 voivodeship roads (County Office in Krakow, 2004) and 3 main railroad lines running through the area of Krakow County. In Zabierzów there is the second largest John Paul II International Airport Krakow-Balice in Poland, which handles passenger and cargo flights, both domestic and international. It is indicated that there is a very good transport accessibility at the county level, however, at the level of internal connections, it is not rated as high, mainly due to problems with the construction of new roads, which result from the dispersed development, as well as from the diversified terrain.

A diagram of the road network with a division into national, provincial and county roads is shown in Figure 2.

Figure 2. The scheme of roads in Krakow County

The analyzed areas are varied in terms of availability of commercial land. The leaders are the municipalities located by the national roads and the Krakow ring road, which is a part of the A4 freeway, and by the airport in Balice, i.e. Wielka Wies, Zabierzow and Liszki municipalities. The areas located on the border with Krakow are of suburban character, where strong changes of rural to suburban development are noticeable.

Within the framework of the conducted research, the areas with service (without public purpose) and industrial function in individual communes were determined, as well as their location in terms of road category and distance from the city limits of Krakow. The areas of areas with the considered purpose were measured on the basis of local plans made available in digital form. In the case of the Skawina commune (without the city area), where there are no local plans available in a digital form, the data were obtained from the information contained in the Study of Conditions and Directions of Spatial Development.

For each of the communes the percentage share of commercial, service and industrial areas in the total area of the commune was determined and the results are presented in Table 1.

Community	The area of commune [ha]	Percentage share of commercial and industrial areas
Światniki Górne	2040	0,82
Mogilany	4355	1,12
Skawina	10020	2,40
Liszki	7200	3,54
Zabierzow	9934	3,74
Wielka Wies	4830	3,15
Zielonki	4860	0,89
Michalowice	5127	0,96
Kocmyrzow - Luborzyca	8180	0,32
Igołomia-Wawrzencyce	6259	0,59

Table 1. Percentage share of areas with commercial and industrial functions

The highest concentration of commercial and service and industrial development is observed in the Zabierzow and Liszki communes. This is primarily due to the very good transport infrastructure in this area in the form of the ring road of Krakow within the A4 freeway and the airport in Balice. The smallest concentration of such areas is in the communes of Kocmyrzow - Luborzyca and Igołomia - Wawrzencyce, which are

characterized by a much lower investment compared to other communes and have a large share of land used for agriculture. Graphic illustration of the concentration of service and industrial buildings is presented in the form of a map in Figure 3.

Figure 3. Map of service buildings concentration

Based on the collected data, the average distance of commercial and industrial areas from the borders of Krakow was calculated with the weighted area of these areas. The highest concentration of buildings with these functions occurs at the border with Krakow. It is mostly a buffer about 3 km wide from the borders of Krakow, as shown on the map in Figure 4.

Figure 4. Buffer for the distance of commercial and industrial buildings from the city borders

The measurement of areas with commercial, service and industrial functions also included the analysis of road categories at which they are located. Taking into account the area criterion, most properties are located on national roads, 64% of the area and 33% on county roads. The smallest number of commercial, service and industrial areas are located on local and provincial roads. In case of voivodeship roads, it may result from their length, which on the territory of Krakow County is 94 km.

5. CONCLUSIONS

The measurement of areas with commercial, service and industrial functions also included the analysis of road categories at which they are located. Taking into account the area criterion, most properties are located on national roads, 64% of the area and 33% on county roads. The smallest numbers of commercial, service and industrial areas are located on local and provincial roads. In case of voivodeship roads, it may result from their length, which on the territory of the Krakow district is 94 km. Properties located in the neighbourhood or the area of influence of the main communication routes constitute a specific group of land, closely related to their characteristic market features, which significantly influence the value, but also prices of these properties. These are mainly factors which negatively influence

the property prices, such as road noise, air pollution, unfavourable scenic values or limitations in the possibilities of land development. However, the location of the road in combination with the planning conditions allows looking at the property from the perspective of its other use, more optimal than the previous one. The way of using the property depends on the profitability of investing in the property, i.e. it is connected with the pursuit of obtaining the highest possible value and selling price. These considerations apply to all types of real estate, with residential real estate showing a greater need to adapt the form of use to the existing environmental factors, while commercial real estate will show a positive impact of the road on their transaction prices.

The conducted research indicates the dependence between the location of retail and service areas on factors such as the category of road at which they are located and the distance from the city center. The largest share of areas with these functions is observed in communes with very well-developed communication infrastructure in the suburban zone. Availability of national roads, a highway or an airport increases the attractiveness of the areas in the area of investor search.

Municipal governments, when undertaking planning activities, should take into account the interests of property owners and strive to optimize land use by assigning to it an appropriate function, which is related to the concept of optimal use and maximization of land value. In case of areas located in suburban zones of cities, by main communication routes, it is justified to situate service and industrial buildings in these areas, which translates into higher value of land and the most effective way of developing these properties.

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