

EXPANSION OF THE TRANSPORT SYSTEM AS A FACTOR AFFECTING THE REAL ESTATE MARKET, WITH THE CONSTRUCTION OF THE OLSZTYN RING-ROAD AS AN EXAMPLE

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Abstract

Improvement of spatial accessibility, associated with changes in the transport system, can affect the local real estate market. This is because better transport accessibility and reducing the time of a journey home affects the location-related attractiveness of real estate.

A ring-road in a town is an example of changes in the transport system of an urban functional area. Such an investment project is being carried out in the Olsztyn suburban zone. The aim of the study was to verify whether the execution of this road construction project affects the local real estate market in the suburban area in the plot segment. The scope of the study included the change of activity and price level. The study period included the years 2007-2018. The analyses were based on descriptive statistics.

This paper presents the effect of transport accessibility on real estate prices, the importance of the ring-road under construction arising from the strategic document analysis, the methodology applied, and the conclusions of the study.

The results indicate a systematic increase in the number of transactions and average unit prices of building plots from the moment a permit for carrying out a road construction project was issued.

Key words: *ring-road, suburban zone, local real estate market.*

JEL Classification: *R23, R30, R41.*

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1. Introduction

Expansion of the transport system affects the real estate market by improving spatial accessibility, which is one of the factors affecting the transaction prices of different kinds of real estate.

Accessibility can be defined as an opportunity of a relation occurring between at least two points (places) (ŚLESZYŃSKI 2014). Therefore, transport accessibility is the possibility that relations can occur with the use of a transport network. Currently, this is one of the main elements which affects location decisions – accessibility determines the advantageousness of a location (SIERPIŃSKI 2010). It is very important to what extent a transport network facilitates the reaching of the necessary devices used to perform the desired actions (GEURS, VAN ECK 2003).

Improving transport accessibility, and, in consequence, reducing the journey time, increases the location attractiveness. Transport accessibility in a “town – suburban area” system is one of the basic factors affecting location decisions and real estate prices, because choosing a place to live is a

compromise between the property price and the cost of commuting to the place. Transport accessibility of a hub town and the location of one's place of residence are closely linked. Everyday mobility depends on earlier long-term location decisions, which in turn depend on the daily necessity to travel (ŚLESZYŃSKI et al. 2015; POELMANS, VAN ROMPAEY 2010; DIELEMAN, WEGENER 2004). For residential real estate (building plots), it is associated with facilitating the daily commute to the hub town – to work, to school, for shopping, for taking advantage of the cultural offer and healthcare, etc. (CHOWDHURY et al. 2013; HABIB 2012; ZOLNIK 2011; VEGA, REYNOLDS-FEIGHAN 2009; KIM 2008; CLAR et al. 2003; GEURS, VAN ECK 2003; CRANE 2000).

A daily commute results in a constant increase in the number of cars, which have become widely available (MAAT, TIMMERMANS 2009), and have become the basic means of transport in rural areas (BANET, ROGALA 2016). In this manner, a daily urban system is created, which includes the hub town surrounded by suburbia and rural areas, where everyday mobility of residents-employees creates interrelations between enterprises, institutions and households (RAKOWSKA 2014).

Studies conducted on various scales indicate that transport accessibility can have a larger or smaller effect on the real estate prices (although various approaches are presented, the majority of them accept that such an effect exists) (NIU et al. 2019; MYUNG-JIN et al. 2016; ZHUGE et al. 2016; SIEJKA 2012; OSLAND, THORSEN 2008; OTTENSMAAN et al. 2008; MATTHEWS, TURNBULL 2007; ZHENG, YANG 2007; ADAIR et al. 2000; SMERSH, SMITH 2000; HENNEBERRY 1998). Improving accessibility also entails demographic changes – an increase in the population size (KOTAVAARA et al. 2014), which indirectly affects prices on the real estate market. It is noteworthy that the density of settlement units and development of residential areas decreases exponentially with increasing distance from the center (CHENG, MASER 2003; BORZACCHIELLO et al. 2010), which is directly linked to accessibility. Additionally, an increase in the time distance is followed by a decrease in the residential areas and, consequently, the population size (cf. SZCZEPAŃSKA 2017).

A city ring-road is an example of an investment project which can affect the real estate market. An external city ring-road has a number of effects (THOMAS, TUTERT 2015; KUDŁACZ 2014; RUDNICKI 2010):

- it diverts the transit traffic out of the hub city, thereby reducing traffic in the city, which improves the environmental conditions and the quality of life in the city,
- it minimizes traffic in sensitive areas (e.g. old town centers, residential and recreational areas),
- it enables faster traffic,
- it improves the quality of life in the suburbs by reducing the time of the journey to the city and back,
- it changes the principle of the accessibility of the city to source-destination movement, from cross-city links, which create a burden on the city core, to tangent and, later, to radial ones.
- it contributes to the economic development of areas,
- it creates an opportunity for introducing modal transport,
- it enhances links between satellite cities and suburban communes of the metropolitan area,
- it stimulates rings of suburban residential areas,
- it reduces the concentration of settlements,
- it makes servicing suburban areas strongly dependent on having a car,
- it increases the transport burden on the road system, while interfering with the natural resources of suburban areas.
- it deprives the central areas (hub) of the possibility of using central financial investment resources,
- it positively affects the way the city is perceived by investors, tourists and residents.

Urban ring-roads are an important element of sustainable mobility, which RUDNICKI (2010) refers to as such transport behaviour of users (affected by the spatial structure and transport structure), in which the length of the journey route is rationalized. ZUZIAK (2010) claims that, in the future, the structural logic of a European city will be based on the consistency of interrelations between spatial development, sustainable mobility and solutions in the sphere of transport infrastructure.

Since an urban ring-road is an element of the transport system of an urban functional area, and transport accessibility can affect the real estate market, research was taken up in this regard, with the ring-road of the Olsztyn Urban Functional Area (OUFA) as an example. A study hypothesis was put forward that the investment project affects the local real estate market in the suburban area in the building plot segment. The aim of the study was to find out whether the expansion of the transport system was reflected in the activity of the local real estate market participants, manifesting itself in an

increased number of transactions and in average unit transaction prices. Descriptive statistics were applied in the study (tabular description, graphic presentation of results, distribution measures). Simple and advanced statistical methods are very often used to analyze the market in land property and cause-and-effect studies, usually to describe the market activity, to study the relationship of time and price and price and real estate features (cf. HOZER, GDAKOWICZ 2016; ZYDROŃ et al. 2016; GAWRON 2014; ROSIK 2013; GAWRON 2012; ZYDROŃ 2011; KRAJEWSKA 2010).

2. Olsztyn Ring-road

The Olsztyn Ring-road is a transport route lying within the course of the trunk roads No: 16, 51 and 53 (Fig. 1). It is planned to be 34.6 km long (the southern ring-road and the north-eastern ring-road). The concept and study work on this road started in the late 1990s. In 2001, the Land Use Plan for the City of Olsztyn and the neighboring communes (except for Dywity) were passed, taking into account the planned ring-road. The design work for this route was started in 2005. Discussion of the route variants and public consultations started in the following years. In 2007, the Council of Ministers adopted the Trunk Road Construction Plan for 2008-2012, which included the plan for modification of the trunk road No. 16 and the construction of the Olsztyn ring-road. The environmental decision for the southern part of the ring-road was issued in 2009, and for the north-eastern part - in 2010. In 2011, the General Directorate for National Roads and Motorways (GDDKiA) completed the construction design for the southern part of the ring-road. In 2013, the Olsztyn branch of the GDDKiA obtained permission to file an application with the Governor of the Warmińsko-Mazurskie Voivodship for issuing permission to execute a road construction project for the Olsztyn southern ring-road. In 2015, a contract was signed for the construction of the first ring-road section; the contract for the second section was signed in 2016, with the first part of the ring being put to use in December 2018, and another in February 2019. (Based on: The Land Use Plan for the Warmińsko-Mazurskie Voivodship and the Olsztyn Municipal Office website <https://obwodnica.olsztyn.eu/index.php?id=2103>)

Regarding the commune of Dywity, the "Analysis of the socio-economic consequences of the execution of the Olsztyn ring-road variant recommended by the GDDKiA in the commune of Dywity" points to a discrepancy between the course of the ring-road and the development directions adopted by the commune for its southern areas, adjacent to the city. The commune's loss due to excluding the land from residential building construction was estimated to exceed 2 million zlotys of lost revenue. For this reason, the commune blocked the project execution in its area.

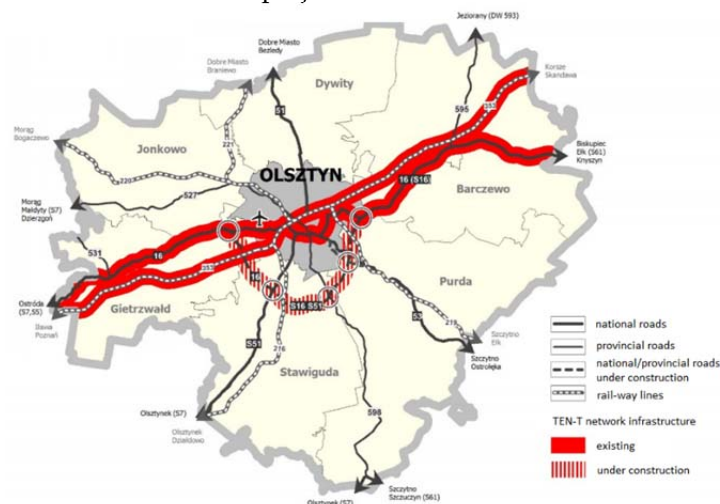


Fig. 1. The main transport layout of the Olsztyn Urban Functional Area against the TEN-T network.

Source: The land use plan for the Warmińsko-Mazurskie Voivodship.

The Olsztyn ring-road is dealt with in a number of local strategic documents (Table 1). In all of them, it is presented as offering an opportunity to divert transit traffic out of the city, thereby streamlining the transport within Olsztyn, and to improve the transport accessibility of the suburban areas.

Table 1

Passages on the Olsztyn ring-road in local strategic documents

Name of the study	Year	What the document says
An update of the transport system study for the city of Olsztyn	2009	The planned Olsztyn ring-road is going to play the following roles: - to take on the transit (domestic and foreign) traffic, currently running through the city, - to improve the transport accessibility of the developing areas around the city where commercial functions will be located, - to improve the journey conditions to Olsztyn from the satellite residential quarters (of detached houses and multi-family buildings) and from the neighboring communes.
The City Development Strategy – Olsztyn 2020	2013	The operational objective oriented towards transport development and natural environment conservation is the modification of the Olsztyn ring-road. Projects within the OUFA (as radial link roads to the ring-road) will be particularly initiated and executed.
The Olsztyn Land Use Plan	2013	Great emphasis is placed on increasing the transport capacity, pointing out that the ring-road will not only take on some of the burden from the city center, but it will also enhance the connection with the regional and national systems.
Socio-economic development strategy for the Warmińsko-Mazurskie Voivodship until 2025	2013	The priorities include modern networks that will help to connect the voivodship with the domestic and international transport systems, including the TEN-T network system. The main directions of activities provided for in the strategy aimed at accomplishing the operational objective of improving the transport accessibility include road investment projects – including the Olsztyn ring-road.
Spatial relations of the public and private transport in the Olsztyn Urban Functional Area	2014	It is emphasized, in the context of urban mobility, that transport accessibility for the communes situated close to the ring-road will further improve. The SWOT analysis mentions the absence of the ring-road among the weaknesses – transit traffic in the Olsztyn center and transport issues in the OUFA communes, with the plans of its construction being mentioned among the Opportunities. It is pointed out that the road construction may increase the development potential of areas situated close to the ring-road, diverting the transit traffic out of the city, though it may also make travellers and tourists bypass Olsztyn. It has also been pointed out that failure to carry out this investment project (along with the tram network) could result in exceeding the capacity of a number of the key transport routes, which could lead to congestion on most main arteries during the traffic peak hours. What is more, it is noted that the planned road alteration in the OUFA through construction of access roads to the southern ring-road will allow for connecting it with the OUFA network.
The public transport development strategy for Olsztyn until 2027.	2015	The document points out that construction of the southern ring-road will have a positive effect on public transport in Olsztyn. The strategic goal for public transport in Olsztyn is to create a system of fast, convenient and always available public transport, which would provide a viable alternative to travelling by private car, by implementing such measures as reducing the number of cars moving around the city, especially passenger cars. Diverting the transit traffic out of the city would help to achieve this goal. It has also been pointed out that the construction of the ring-road with a network of access roads will not only divert the cargo transit transport out of the city, but it will also make it easier for residents of nearby towns to reach the center of Olsztyn by the modified entry roads. Removing the transit traffic from the inner city streets will improve the conditions of public

		transport functioning in Olsztyn.
Strategy for the Olsztyn Urban Functional Area	2016	The function of the ring-road in the OUFA is being emphasized. Construction of the ring-road will improve the transport of the functional area residents to and from the city. OUFA residents travelling between communes will not have to drive through the center of Olsztyn. This solution will enable by-passing transport bottlenecks, streamlining the traffic in the existing transport corridors and, by controlling congestion, it will significantly improve the comfort of the journey of all OUFA and Olsztyn residents.
Mobility plan for the Olsztyn Urban Functional Area until 2025	2017	When completed, the ring-road will lift some of the burden off the Olsztyn center.
The environmental impact forecast for the draft mobility plan for the Olsztyn Urban Functional Area until 2025	2017	When completed, the ring-road will divert traffic out of residential areas (town ring-roads), which will prevent the formation of jams by bottleneck reduction and will improve the freedom of traffic, which directly affects the efficiency of fuel consumption in cars and reduces pollution emissions. Diverting traffic from town centres to the ring-roads will move pollution to uninhabited areas, and any pressure will have a negative effect on the fauna and flora. It should be emphasized that, although excessive noise is present in large cities and is acceptable in such places, areas outside human settlements, especially those of high natural value, should remain free of such noise. Moreover, it must be borne in mind that specific undertakings will have a beneficial effect on some people (e.g. diverting traffic to the ring-roads), whereas they will have a negative effect on other groups, especially where new transport routes will be built.
Transport system development study for the city of Olsztyn	2017	It is assumed that the Olsztyn southern ring-road will take over burdensome transit traffic, but it will also be used for inter-city and inter-quarter traffic.
The land use plan for the Warmińsko-Mazurskie Voivodship.	2018	It is being pointed out that construction of the southern ring-road is a project of key importance for the improvement of the road transport within the Olsztyn Urban Functional Area. The ring-road will divert transit traffic from Olsztyn by taking over traffic from the western, eastern and southern directions. It will streamline the traffic in the city streets. It will also affect the local road transport in Olsztyn and its suburban area.

Source: prepared by the author based on the documents mentioned.

3. Study methodology

This study dealt with the local real estate market in the suburban zone of the Olsztyn Urban Functional Area in the building plots segment. Building plots were identified in accordance with the definition laid down in the Land Use Planning Act of 27 March 2003 (Journal of Laws of 2018, item 1945, as subsequently amended) as pieces of land real estate or plots of land, whose size, geometric features, access to public roads and infrastructural development meet the requirements for the construction of buildings and structures laid down in separate regulations and by-laws. The category of buildings and structures was narrowed down to include only single-family detached houses. Both land allotted in local land use plans for single-family residential buildings and land not covered by local plans was included in the analyses. Transactions with individuals as purchasers were analyzed.

The spatial range covered the part of the Olsztyn suburban zone (communes and precincts) which the ring-road runs through, as well as neighboring precincts. The area through which the ring-road will run includes record precincts situated in communes directly neighboring the city: Barczewo (precincts: Nikielkowo, Wójtowo), Gietrzwałd (precincts: Gronity, Naterki), Purda (precincts: Klebark Mały, Klewki, Linowo, Ostrzeszewo), Stawiguda (precincts: Bartąg, Dorotowo, Szczesne, Tomaszkowo). Neighboring precincts are those which border on those mentioned above: commune of Barczewo – Łęgajny, Kaplityny, Bogdany, commune of Gietrzwałd - Łupstych, Unieszewo, Sząbruk, commune of Purda - Kaborno, Klebark Wielki, Szczesne, Silice, Trękus, Trękusek, commune of Stawiguda – Gałławki, Jaroty, Kręsk, Majdy, Stawiguda, Ruś, commune of Dywity – Zalbki, Gmina Jonkowo – Warkaly (Fig. 2).

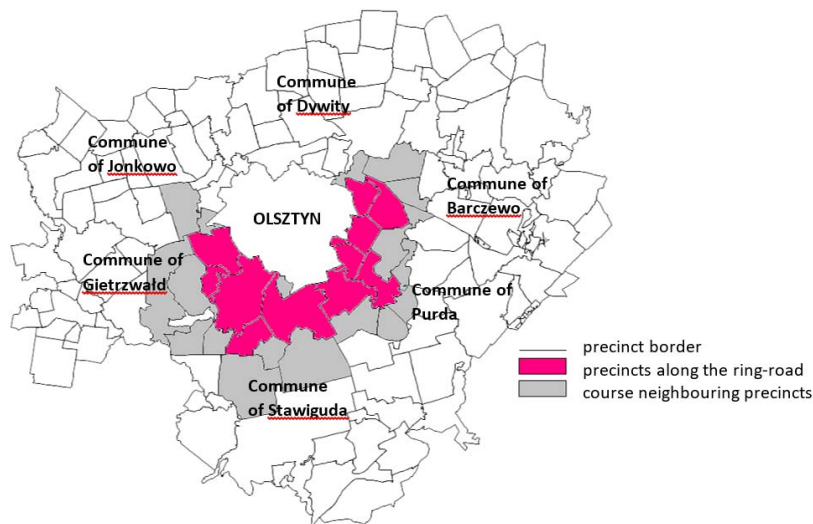


Fig. 2. Spatial range of the study. Source: prepared by the author.

The scope of the study included the activity of the market participants and variability of the market prices. Local real estate market activity was analyzed by means of a parameter which characterized the demand, manifesting itself in the number of transactions in the individual years of the analysis. Changes in the market prices were reflected in the level and dynamics of average unit prices. These are the basic parameters that describe the real estate market and the activity of its participants, which are normally used in its description. Descriptive statistics were also provided with respect to the land taken over for the ring-road construction, which is also an element of the local real estate market. Additionally, an analysis of changes in temporal accessibility, number of registered passenger cars and changes in the population size was performed as elements which are directly and indirectly linked to changes in the transport system, and which constitute the real estate market environment.

It was determined based on the accumulated data, at the precinct level, what changes took place in the number of transactions concluded and changes in the unit prices of building plots during the period under analysis. Additionally, analyses were also performed regarding the division of the parcels of real estate included in the investment project and compensation paid for the real estate acquired for the project. An increase in the number of passenger cars in communes was determined and juxtaposed with changes in the population size and the number of people per registered car was calculated.

The time range covered was 2007-2018. The analyses were performed with descriptive statistics (tabular description, graphic presentation of results – bar graphs, trend line, distribution measures – arithmetic mean).

The sources of data included: The price and value register maintained by the County Center for Geodetic and Cartographic Documentation in Olsztyn, data from the “Pojazd” system from the Central Vehicle Register, Transport Department of the County Office in Olsztyn, registers maintained by the General Directorate of Country Roads and Motorways, Olsztyn Branch.

4. Results

The document “Spatial relations of the public and private transport in the Olsztyn Urban Functional Area”, issued in 2004 and based on a survey conducted among 1417 residents of the OUFA, specifies

that:

- 14.04% of the respondents see the absence of the ring-road as the main transport issue in Olsztyn, resulting in a congested center and transit traffic running through the city,
- in their obligatory journeys, residents of communes in the OUFA choose a car much more frequently – 73.53% of the respondents every day, 14.22% several times a week, 1.96% once a week, 6.37% sporadically and 3.92% never,
- work is the main destination of such journeys – 81.37% of the responses, followed by school – 9.31% and shopping – 7.84%,
- a car is the dominant mean of transport - 74.05%, followed by bus - 21.62%,
- the distance most frequently covered in connection with work/education – 21-50 km (37.84%), 11-20km (35.14%) and 6-10km (14.05%),
- the choice of the means of transport is mainly affected by the journey time (66.67%).

The main directions in which residents of the OUFA suburban zone residents commute to work are shown in Table 2.

Table 2

Commuting to work in the OUFA suburban zone.

Commune	People commuting to work to Olsztyn (%)	People commuting to work to a village in a different OUFA commune (%)	People commuting to work to a different village in the same OUFA commune (%)
Barczewo	71.9	5.8	22.3
Dywity	81.2	5.3	13.5
Gietrzwałd	72.2	8.3	19.4
Jonkowo	68.2	4.7	27.1
Purda	81.9	5.8	12.3
Stawiguda	81.7	2.2	16.1
Olsztyn UFA	76.9	5.1	18.0

Source: The public transport development strategy for Olsztyn until 2027. Reda - Olsztyn, 2015.

The spatial distribution of temporal accessibility in the area under analysis is important in the context of commuting to work. Improving temporal accessibility by the construction of a ring-road results in better conditions of commuting to work and, in consequence, in people deciding to move to the suburban zone. This can result in a larger number of transactions (of building plot sale/purchase), with a consequent increase in the demand and transaction prices. It also increases the population size and the number of passenger cars, which are the main means of transport in households.

Measurement of temporal accessibility from the center of Olsztyn shows local fluctuations – the largest in the south-eastern part of the area under study. The accessibility of the precincts under study, i.e. the average journey time to villages (precincts) through which the ring-road runs, was analyzed with Google Maps. The tests were conducted at the same time (6.00 p.m.), after the rush hour, in February 2016 and 2019 (after part of the ring-road was put into use). The Municipal Office in Olsztyn was the reference point. The results are shown in Fig. 3.

The data show that changes in the temporal accessibility are usually small. This probably results from the fact that the construction work in access roads to the ring-road is still in progress, which slows down traffic considerably, and the finishing work in the last fragment of this construction enterprise is not completed. Additionally, choosing to take the ring-road means that a longer distance must be covered.

It is also noteworthy that a continuous increase in a population size in the suburban zone results in a systematic increase in the number of registered passenger cars (Table 3), with a consequent increase in traffic density.

An index denoting the number of people per one registered passenger car in the whole suburban zone decreased from 14 to 13 people. The largest decrease was noted in the commune of Gietrzwałd and the largest increase – in the commune of Stawiguda (Fig. 4). This shows that the number of cars per household is increasing, and the number of people using a car as a means of transport is also

growing; it is therefore, desirable to make some changes in the transport system to improve the transport accessibility and to streamline the traffic.

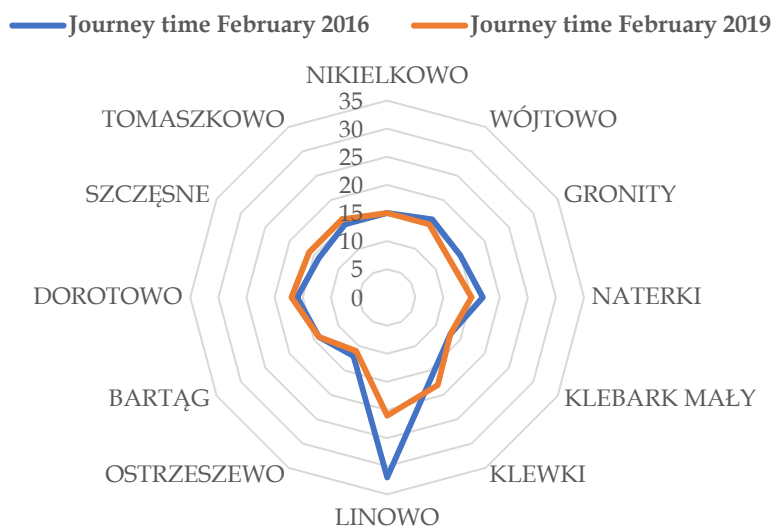


Fig 3. Temporal accessibility of selected precincts in the urban zone of the OUFA. Source: prepared by the author.

Table 3

Number of registered passenger cars in communes in the OUFA suburban zone in 2007 and 2018

Commune	Number of cars 2007	Number of cars 2018	Increase in the number of cars 2007-2018	Increase in the population size 2007-2018 [people]
Purda	521	601	80	1,060
Stawiguda	482	782	300	4,483
Gietrzwałd	346	462	116	400
Jonkowo	514	573	59	1,304
Dywity	780	921	141	1,177
Barczewo	960	1,121	161	486
Total	3,603	4,460	857	8,910

Source: prepared by the author based on data from the "Pojazd" system from the Central Vehicle Register, Transport Department of the County Office in Olsztyn.

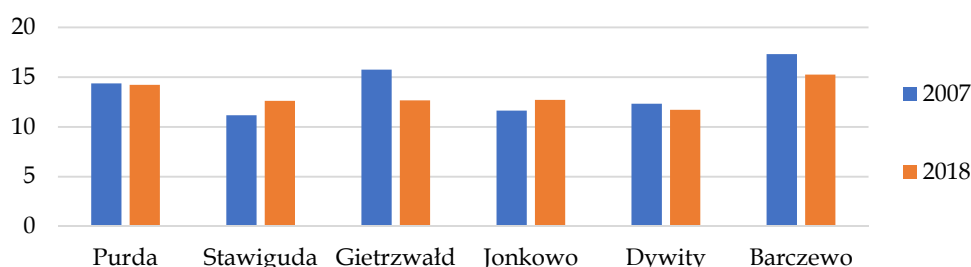


Fig 4. The number of people per single registered passenger car. Source: prepared by the author based on data from the "Pojazd" system from the Central Vehicle Register, Transport Department of the County Office in Olsztyn and the population register for the communes in the Olsztyn suburban zone.

There has been a revival of trade in the local real estate market in the building plot segment since 2013. This coincides with the time when the invitation was issued to tender bids for the construction of

the ring-road (Fig. 5). Contracts for construction of subsequent fragments of the investment project were signed in 2015 and 2016; the execution phase started at that time.

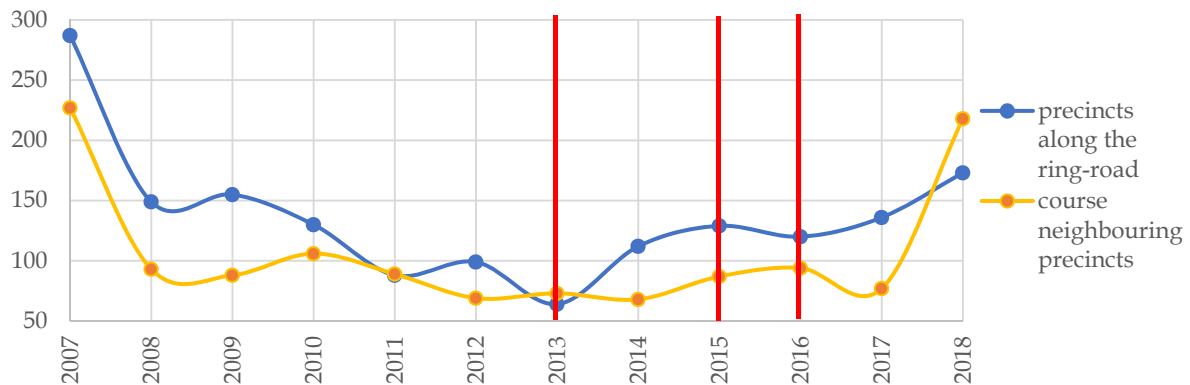


Fig 5. The number of transactions concerning building plots concluded during the period of 2007-2018 in the precincts through which the ring-road runs and the adjacent precincts. *Source:* prepared by the author based on the price and value register maintained by the County Centre for Geodetic and Cartographic Documentation in Olsztyn.

In order to make the results in Fig. 5 more detailed, Table No. 4 shows the number of transactions concluded over the analyzed period in individual precincts through which the ring-road runs. The general tendencies presented in Fig. 5 are corroborated especially for the precincts of Nikielkowo, Wójtowo, Ostrzeszewo, Szczęsne, Bartąg and Bartązek, and Tomaszkowo. Gronity does not have any more areas for investment projects, whereas Linowo is a typically agricultural area, with no building plots.

Table 4

Listing of transactions concerning building plots concluded during the period of 2007-2018 in the precincts through which the ring-road runs

The number of transactions concerning building plots												
Precinct	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Nikielkowo	44	35	31	31	20	20	16	24	23	20	26	24
Wójtowo	50	9	11	14	9	11	6	7	17	20	25	41
Gronity	5	15	4	2	1	4	1	1	1	2	2	5
Naterki	11	5	1	1	3	5	2	1	7	8	0	4
Klebark Mały	4	14	35	7	3	8	5	8	6	9	6	4
Klewki	5	6	3	6	3	4	2	4	7	4	6	5
Linowo	1	1	0	0	0	0	0	1	1	0	1	0
Ostrzeszewo	11	4	9	11	1	6	2	8	9	6	10	11
Szczęsne	15	12	9	11	9	10	4	10	10	9	7	5
Bartąg, Bartązek	54	18	23	21	17	21	18	30	29	21	32	39
Dorotowo	42	18	12	13	9	5	3	5	8	4	4	7
Tomaszkowo	45	12	17	13	13	5	5	13	11	17	17	28
Total	287	149	155	130	88	99	64	112	129	120	136	173

Source: prepared by the author based on the price and value register maintained by the County Centre for Geodetic and Cartographic Documentation in Olsztyn.

The trends for average unit transaction prices of building plots are similar to those observed for the number of transactions – an increase in the unit transaction price is observed in the majority of precincts, both along the course of the ring-road (Fig. 6) and in those adjacent to it. Such a situation is observed in 9 out of 12 precincts which the ring-road runs through. The highest average unit prices were noted in 2010, and the lowest were in 2013, when they decreased to the level of in 2007. A distinct and steady price increase was observed between the date of issuing the permit for execution

of the road construction project (2013) and 2017. Partial price stagnation and trend reversal was observed in 2017-2018.

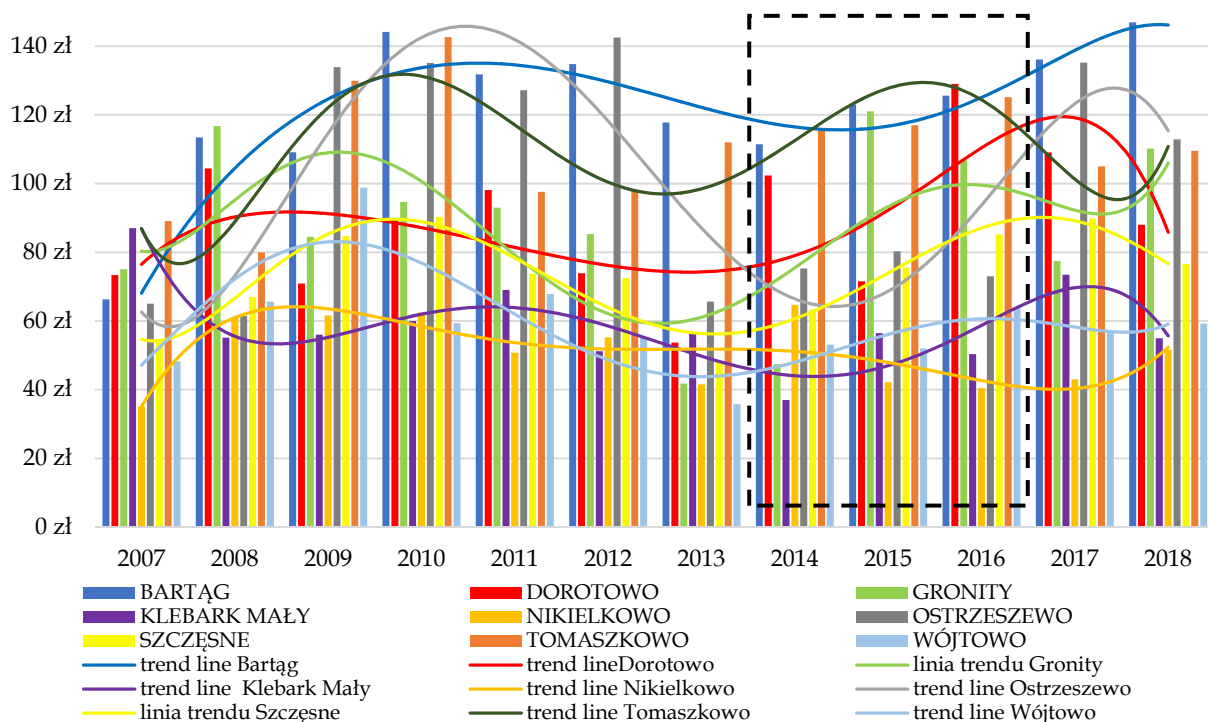


Fig 6. Average building plot unit prices and the trend lines in 2007-2018 in the precincts through which the ring-road runs. *Source:* prepared by the author based on the price and value register maintained by the County Centre for Geodetic and Cartographic Documentation in Olsztyn.

The local real estate market may have been affected by the acquisition of land for the ring-road construction. A total of 534 plots were included in the division process, with a total area of 1,400.1960 ha. The division resulted in the formation of 869 plots, 570 of which, were acquired for the project with the total area of 452.9147 ha. Part of these plots were owned by the State and taken over with no compensation. 378 plots, with a total area of 199.7722 ha were taken over for compensation altogether amounting to PLN 112,386,777.12. The final compensation payment decisions were issued in 2014. Therefore, a listing was prepared of the values specified in these decisions, with these compared to the prices on the local market, which is shown in Table 5.

Table 5

A list of average values from appraisal reports and unit transaction prices in the suburban zone precincts through which the Olsztyn ring-road runs

Precinct/ commune	Average value appraisal report [PLN/m ²]	Min value appraisal report [PLN/m ²]	Max value appraisal report [PLN/m ²]	Min market prices 2014-2018, building plots [PLN/m ²]	Max market prices 2014- 2018, building plots [PLN/m ²]
Nikielkowo	78.98	67.00	92.78	9.84	185.65
Wójtowo	75.11	20.53	166.16	12.57	201.73
Gronity	61.50	20.84	162.05	47.43	153.75
Naterki	86.26	33.36	139.22	14.94	146.2
Klebark Mały	71.56	70.54	95.70	24.99	102.62
Klewki	30.89	30.89	30.89	8.17	95.60
Szczęsne	55.54	31.87	114.98	19.22	195.58
Linowo	31.73	30.89	64.83	21.70	30.70

Ostrzeszewo	68.59	53.67	70.81	10.49	171.18
Bartąg	30.52	21.98	160.53	16.75	350.23
Dorotowo	30.03	29.64	30.22	20.00	209.79
Tomaszkowo	50.10	21.39	148.78	15.35	272.07

Source: Source: prepared by the author based on the data from the General Directorate for National Roads and Motorways, Olsztyn Branch, and the price and value register maintained by the County Center for Geodetic and Cartographic Documentation in Olsztyn.

It must be stressed that the value mentioned in a property appraisal report is not equal to the compensation amount mentioned in decisions. It can be increased by the amount of outlays made, the value due to the real estate release and the cost of moving to a new place of residence.

Considering the minimum values specified in property appraisal reports, one can see that mainly land suitable for development was taken over. This is due to the immediate neighborhood of the city of Olsztyn, with mainly residential buildings situated in these areas.

5. Summary and conclusions

The analyses presented here concern the first stage of a study of the impact of a ring-road on the local real estate market in the Olsztyn UFA. They cover a period between the presentation of the ring-road course (2007) and its first fragment being put to use (end of 2018). They show that modification of the transport system affects the local real estate market, which confirms the thesis put forward in the introduction. Issuing a permit for the construction of the ring-road, issuing invitations to tender bids for its construction and signing contracts for the construction of its fragments coincides with the revival of the local market in the suburban zone in the building plot segment, which manifests itself in the number of transactions concluded (the years 2013-2017). It also concerns changes in unit transaction prices.

Work on the fragment of the Olsztyn ring-road under construction is close to coming to an end, though it is still continuing both on the access roads from Olsztyn and on the ring-road fragment from the Olsztyn Jaroty to the Olsztyn Południe (Tomaszkowo) interchanges. Putting both the whole ring-road and the access roads to use should reduce the journey time for residents of the majority of villages near it, especially those situated close to the Olsztyn Zachód (Kudypy), Olsztyn Południe (Tomaszkowo), Jaroty, Pieczewo and Olsztyn Wschód (Wójtowo) interchanges. Only after the project is completed and after a sufficiently long time has passed will one be able to conclude how the investment has affected the car traffic and the transport accessibility, both in Olsztyn itself and in the suburban zone. Improved transport accessibility can affect the location decisions concerning the choice of a place of residence and location of investment projects and, in consequence, transactions on the local real estate market, especially in the building plot segment.

It seems that residents of the commune of Stawiguda will benefit most from the project, as the Olsztyn-Olsztynek expressway will be constructed at the same time. Therefore, the area will still have the best transport accessibility, which manifests itself in the highest building plot unit prices.

Because of the absence of the northern Olsztyn ring-road, caused by the resistance of the residents and authorities of Dywity, the transit traffic will be only partly diverted out of the city. Construction of the northern Olsztyn ring-road is not provided for in the current Trunk Road Construction Programme for the years 2014-2023 (with an outlook until 2025). This may result in the restriction of the real estate market increase in the commune of Dywity, to the benefit of those communes which have access to the ring-road.

The communes can use the ring-road as a growth stimulant. Local land use plans for investment areas are being prepared taking into account their good transport accessibility. The planned functions, taking into account the new transport conditions, will constitute new determinants for the local real estate market. For example, the commune of Purda started developing its land use plan for areas adjacent to the ring-road, allotting them for development. Likewise, the commune of Stawiguda allotted land adjacent to the Tomaszkowo interchange for service, commercial and production establishments.

6. Literature

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