The Influence of Commercial Space Utilization on Residential Area: A Case of Study of The Education Area of Kartika Street Kentingan in Surakarta City

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Abstract— Abstract. The Education Area of Kentingan in Surakarta City has a function as a new growth center. The area has implicated the development of commercial activities in the surrounding area, especially in the area of Kartika Street. The purpose of this study is to find out commercial activities effects from how to transform settlement space utilization in the area Kartika Street. Quantitative method will be applied with spatial analysis and quantitative descriptive technique that uses primary and secondary data. The subject of this research is commercial in the area of Kartika Street. The results of the analysis showed a comprehensive phenomenon of space utilization of settlement spaces into commercial in the education area and finding 4 factors formed that affect in space utilization, namely higher education factors, location factors, accessibility factors, as well as economic factors.

Index Terms—*space utilization; commercial activities; education area*

I. INTRODUCTION

The development of an area can be influenced by the population, community activities, and community needs. Residents are the lifeblood of a city because of their needs and activities as a trigger for the development of a city. Population growth and increased activity have an impact on increasing space requirements (Widowati & Wijaya, 2014). The increasing number of residents in an area will demand service activities to meet the needs of daily life (Scott, 2006). The existence of developments in an area becomes an attraction for residents to migrate to other places. Therefore, an area that is experiencing development can increase the density in an area.

The increasing population density in an area will affect the availability and demand for land. In this case, changes in spatial use will result in many changes from certain land to other land uses caused by economic developments and population dynamics which always increase every year. (Weng, 2002). According to Cullingworth & Caves (2013), The factors that influence land use change are the concentration of population in all their activities, accessibility to activity centers and city centers, road networks and the availability of infrastructure. On the other hand, Verburg & VeldKamp (2004) said the use of the surrounding land can affect changes in land use and the development of social and economic activities of urban residents in the future. Such events are common in big cities which provide facilities to fulfill daily life without having to look elsewhere.

Higher education is an example of an institution in an urban area that has existed for a relatively long time, and has a dominant influence in the development of an area.

The existence of higher education institutions, with their staff and students, demands the existence of facilities by both the local government and the private sector, but also has an influence on cultural, social, scientific and economic development. (Rudiarto et al., 2015). If this condition can be achieved, then both cities and universities can complement each other so that mutually beneficial relationships can be created.

Education area is an area that has implications for the socio-economic development of the community and affects the physical development around the area (Wardhana & Haryanto, 2016). The existence of universities will have an impact such as the emergence of land use change, especially non-built land into built-up land, especially in mixed building functions. Along with the development of the area, it will cause the conversion of land into built-up land to be out of control (Shankar & Vidhya, 2013). These changes will also affect physical, social and economic development. In the end, development in growth centers such as educational areas will spread and form a spatial pattern (Kumar & Sangwan, 2013).

The driving factor that accelerates development in the educational area is the demand for student needs. Demand for community needs will encourage commercial activities. This shows that the development of the democratic system of society in its survival, including in the economic field. If it is related to the demand for student needs, this influence can be seen from the emergence of commercial activities in the form of lodging, hotels, apartments, banks, improvements in the transportation system, and the increasing quality of infrastructure (Ehinmowo & Eludoyin, 2010). Based on

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the service scale, there are three types of trade and service commodity classifications according to Gallion & Eisner (1983) and according to Law No. 7 of 2014 which is divided into primary, secondary, and tertiary commodities.

In the development of commercial activities, it is necessary to know the influencing factors in order to identify the direction of development there are four factors, namely accessibility to the market area and direct access to the highway, the range of existing commercial activities must be adjusted to the type of commercial in order to be able to meet the expected targets, suitable terrain where the development of commercial activities will develop if the business location is in a relatively flat topography, and the availability of facilities and infrastructure (Kaiser, Godschalk, & Chapin 1995). Therefore, the emergence of commercial activities cannot be separated from economic, physical, and environmental factors.

Migration of population is a classic problem that arises in large cities such as what happened in the city of Surakarta. Population migration on a large scale began to occur in Surakarta City, especially Jebres Village every year in addition to migration or urbanization. The migration is in the form of the presence of new students at a university. The quota given by each university is very high for new students, it can even reach thousands of students. In addition, there are several leading universities in the city of Surakarta as a goal to continue higher education levels. The phenomenon of the development of the educational area when it occurs can be shown from the growth of retail businesses which are mostly carried out by small, medium, and sporadically scattered entrepreneurs which are considered to be potential locations.

One of the educational areas that has a function as a center for educational activities in the city of Surakarta is in the Kentingan Higher Education Area, Jebres Village. Commercial activities appear to dominate with the existence of higher education such as Presence Universitas Sebelas Maret (UNS), Institut Seni Indonesia Surakarta (ISI), and Sekolah Tinggi Ilmu Kesehatan (STIKES) Aisyiyah Surakarta. The existence of an educational area will have an influence on an area, including increasing population and affecting the physical development of the city which gives rise to supporting activities such as commercial activities (Haryanto, Soetomo, & Buchori (2016). These commercial activities are a creative community economy accompanied by technological developments created by the community as well as service businesses related to cellular phones, computers, laundry, restaurants, cafes, hotels, boarding houses, health, beauty, photocopying, and various other small businesses. Commercial activities in the Jalan Kartika area can be seen in Figure 1,
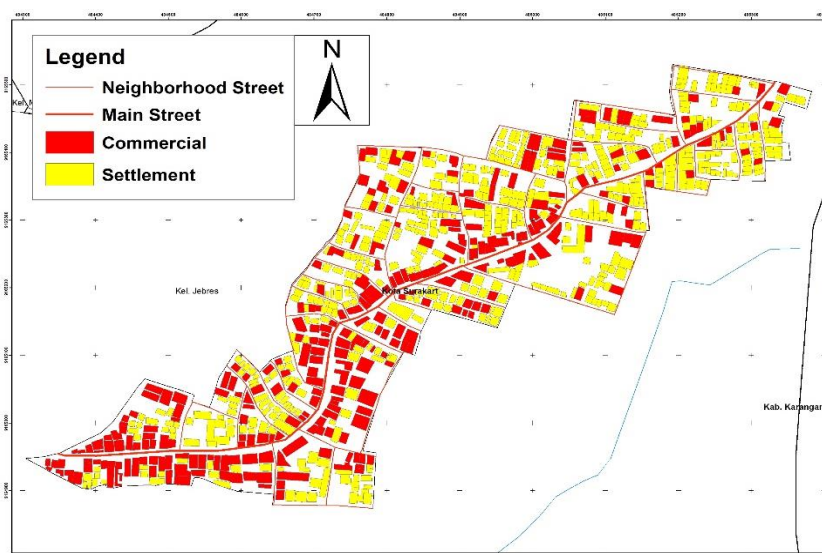
| Cellphone Shop | Minimarket | Foto copy | Boarding house |

Figure 1. Commercial Activities in the Kartika Road Area

Jalan Kartika Corridor is one of the areas that is experiencing very rapid development in Jebres Village. This corridor experienced a very rapid change in space utilization from the former being a residential building, but over time the change in the function of the space developed quite rapidly. Almost the entire length of the Jalan Kartika corridor has changed its function to become commercial. Basically, any land in the educational area is considered a potential land that can be used as a place to make profits. Not only along the main corridor road, even entering the residential area is not spared from commercial activities. This provides advantages for business actors.

There are several studies related to land change as well as in Kusrini et al. (2011) who conducted research by looking at the form of land use from non-built to built in the new growth center of Gunungpati which is close to settlements and universities. The study from Hermaputri & Haryanto (2013), conducted in the Jalan D.I Panjaitan Samarina Corridor by looking at the factors that affect commercial activity in the trade and service area. Meanwhile, Fransinata (2015) conducted research on changes in the function of buildings due to the existence of the Education Area in Tembalang Village. Next, Wardhana (2016) who conducted research to examine the use of space for commercial activities in the Jalan Taman Siswa corridor and to find the causes of land development in the area.

The emergence of commercial activities in a residential area is a natural phenomenon. However, this becomes unreasonable because commercial activities develop in residential areas and cause land which was originally designated residential land to be turned into commercial activities. Based on the descriptions of previous studies, this research should bring up a change in the pattern of land use development and look at the influencing factors in the education area. In the end, the development of commercial activities in the Jalan Kartika area needs to be investigated so that it can be seen how the changes in the use of space in the surrounding areas. This research was also conducted to see how the development of commercial activities in the Jalan Kartika area and to see the factors causing changes in space use both from environmental factors, location factors, and the influence of educational activities as a center of activity.

II. RESEARCH METHODS

The research which analyzes the change in the use of residential space to become commercial in the Jalan Kartika area uses quantitative research methods. This method is a scientific method because it meets scientific principles, namely concrete/empirical, objective, measurable, rational, and systematic. In this method using research data in the form of numbers and analysis using statistics. The analysis that will be used in this study includes an analysis of the use of commercial activities in the Jalan Kartika area to determine the development of commercial activities in the Jalan Kartika area. This analysis uses data in the form of maps and images to find out how and the direction of the development patterns that occur.

In addition, it also uses data obtained from questionnaires and interviews as the basis for information related to the emergence of existing commercial activities. The second is the analysis of factors that influence commercial development to determine the factors that influence the development of commercial activities in the Jalan Kartika area with the

presence of universities and market demand as factors that underlie the development of commercial land use along the road corridor. The data was obtained by using a questionnaire on the respondents, namely the owners or employees of existing commercial activities. The sampling is obtained by using the Slovin formula with a total population of 360 commercial activities. This amount was obtained after conducting a quick survey of commercial activity calculations along the Jalan Kartika area.

The number of samples obtained is based on the Slovin formula, with a confidence level used to determine the response of 90% and an error tolerance limit of 10% with a population size of 360 attempts so that a sample size of 79 is obtained. The sampling technique that will be used in sampling is purposive sampling. which is intended so that the respondents who become the data source are clear, namely the perpetrators of commercial activities in the Jalan

Kartika area and do not collect data from non-commercial activities.

III. RESULTS AND DISCUSSION

Analysis of Space Utilization in the Kartika Road Area. To analyze changes in space utilization factors, it is necessary to identify the existing use of space in the Jalan Kartika area with the comparison of space utilization that has been carried out by the regional government as stated in Surakarta City Spatial Plan Details/Rencana Detail Tata Ruang Kota Surakarta (RDTR). This is done to see whether the existing space utilization is in accordance with the directions or vice versa. Then the RDTR map will be compared with the existing spatial utilization map on Jalan Kartika Area. Map of spatial use in the Kartika area according to the RDTR and the existing map of space utilization in the Kartika area of Jalan Kartika can be seen in Figures 2 and 3,
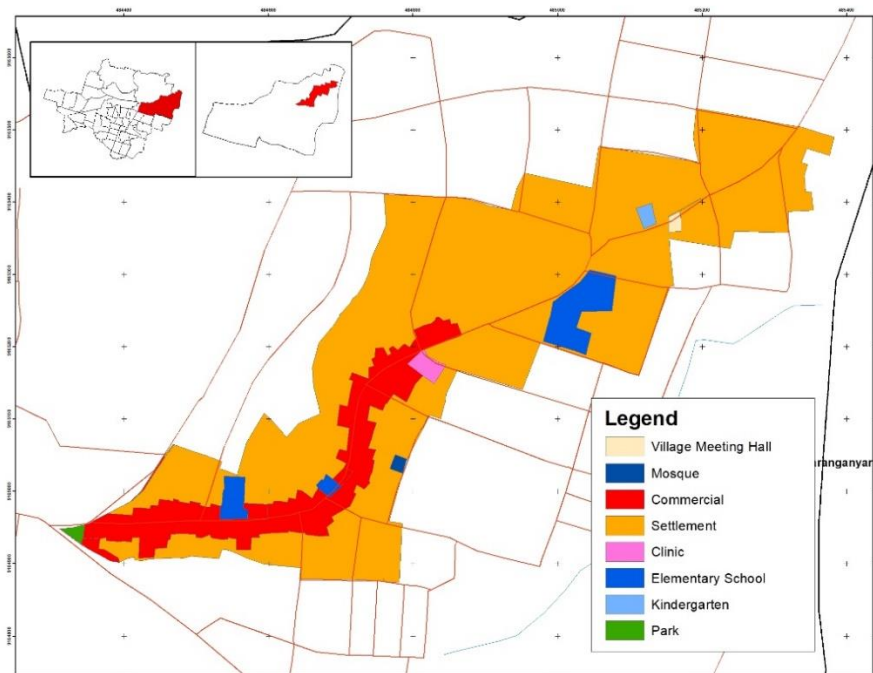
Source: Surakarta City Spatial Plan Details *2011-2031*
Figure 2. RDTR Map of Surakarta City 2011-2031 around Jalan Kartika
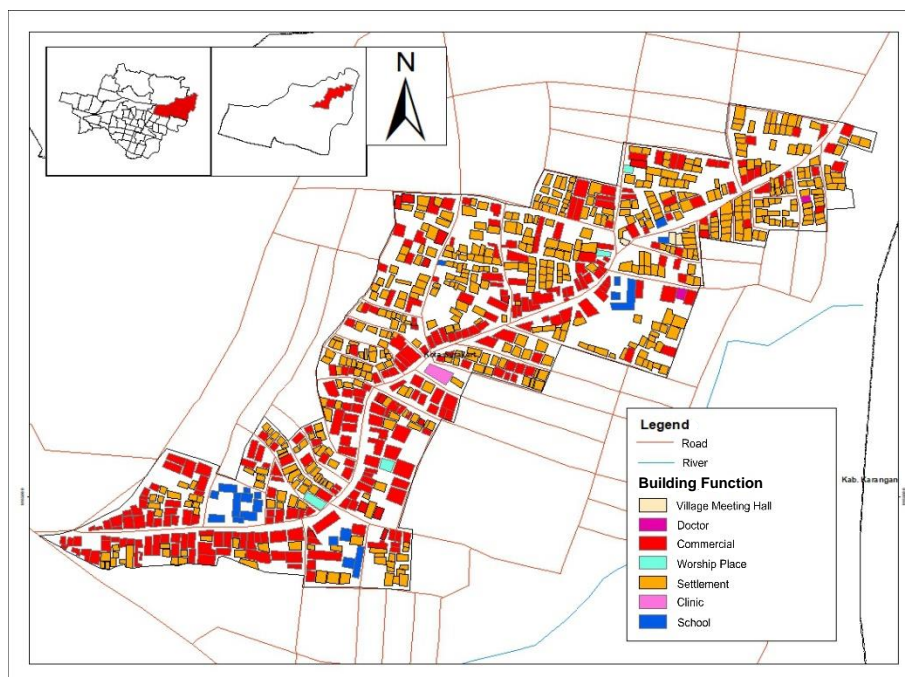
Source: Researcher Analysis, 2018
Figure 3. Map of Existing Spatial Utilization of Jalan Kartika

According to the Surakarta City's RDTR in 2013, the Jebres Urban Village area is included in BWK V. BWK V in the Surakarta City Spatial Detail Plan has a directive, namely to function as a center for education services. The existence of 3 universities such as Universitas Sebelas Maret (UNS), Institut Seni Surakarta (ISI), and STIKES Aisyiyah Surakarta in Jebres Village is in accordance with the policies issued by the Surakarta City Government. However, if you look at the plans that have been carried out by the government contained in the RDTR document for the City of Surakarta, the Jalan Kartika area is mostly planned as a residential area in only a few parts located along Jalan Kartika which are planned as commercial. Over time and the development of the Kentingan educational area, the Jalan Kartika area experienced very rapid commercial development. This is because commercial is intended to meet the needs of overseas students. With the development of the Kartika Road Area, the current use of space is not in accordance with what should be planned. The Jalan Kartika area is starting to be dominated by the many commercial activities that exist. Commercial activities are also developing to enter residential areas not only along the corridor.

The analysis of the pattern of development of commercial activities aims to determine the distribution pattern of commercial activities in the Jalan Kartika area. The explanation of this development pattern is based on the development pattern according to (Hartshorn, 1992). The following is a map of the development pattern of the Kartika Road Area which can be seen in Figure 4.
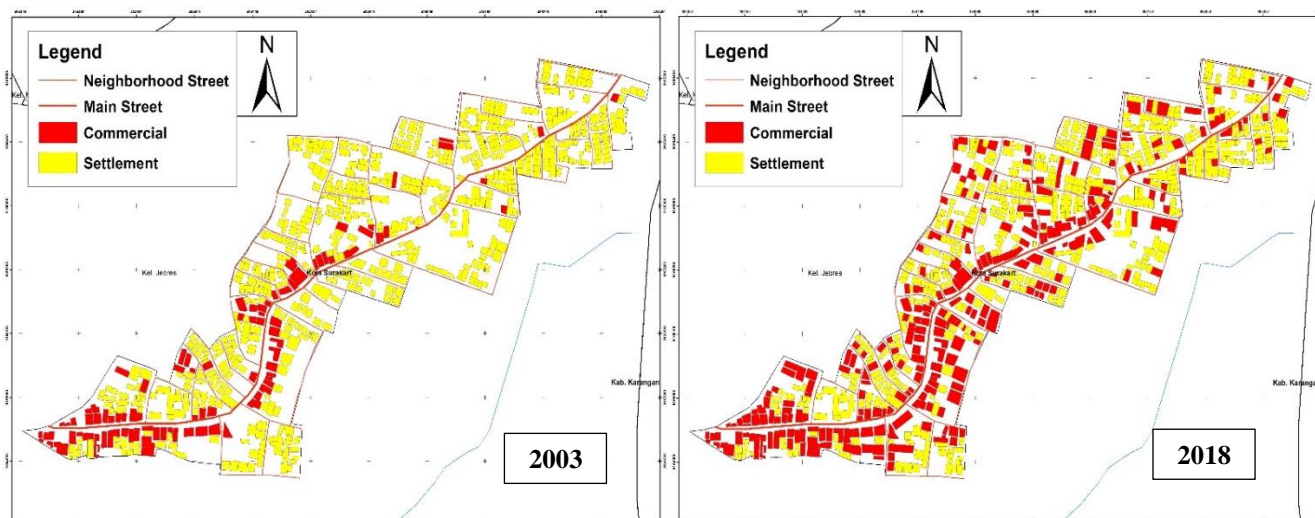
Source: Researcher Analysis, 2018

Figure 4. Commercial Development Patterns in the Kartika Road Area

Based on the picture above, it is known that the pattern of development of commercial activities in the Jalan Kartika area is in the form of a pattern of specialized areas or special areas where commercial activities grow sporadically with certain interrelated commodities and ribbons. The pattern of specialized areas is a pattern of development of economic activities that is not planned but arises because of a common interest. This is different from research (Hermaputri & Haryanto, 2013; Wardhana & Haryanto, 2016) which has a pattern of ribbons development that follows the road/corridor where various commercial activities are spread that depend on the traffic flow in the corridor. Meanwhile, the Jalan Kartika area has integration, namely moving to support the needs of students as actors in activities from higher education in the form of guest houses/boarding houses, restaurants, laundry, and commercial support for other student needs.

Analysis of the Characteristics of Commercial Activities in the Kartika Road Area by Zone Division. This analysis will discuss the characteristics of commercial activities in the Jalan Kartika area. In this analysis, it is divided into 2 zones based on a predetermined grouping of zones. It is divided into 2 zones, namely zone A and zone B. There are 80 questionnaires as a sample which were distributed to owners/employees of commercial activities to determine the characteristics of commercial activities in the Jalan Kartika area. Based on the results of the analysis of commercial characteristics in the Jalan Kartika area, it is dominated by primary commodities Gallion & Eisner (1983), primary commodity trading activity, is a type of trading that is needed on a daily basis and has a high daily purchase frequency. So that these characteristics are in accordance with the development of primary commodities in the Jalan Kartika area due to the high demand for meeting the daily needs of students and the surrounding community. The results of the analysis of the characteristics of commercial activities in the Jalan Kartika area based on zone grouping can be seen in Table 1 as follows.

Table 1

Results of the Analysis of the Characteristics of Commercial Activities in the Kartika Road Area Based on the Grouping of 2 Zones

No	Zone	Commercial Characteristics	Space Utilization
1	Zona A	Commercial activities that dominate in zone A in the Jalan Kartika area are primary commodities and housing services. The dominant ownership of commercial activities is mostly private property with the dominant operating time between 13-17 hours per day. Existing commercial activities have been operating for an average of 6-10 years. In addition, most of the reasons for establishing a business and choosing its location are based on the presence of universities in the surrounding environment.	Most of the commercial buildings in zone A are used for business purposes only.
2	Zone B	Commercial activities that dominate in zone B in the Jalan Kartika area are commercial types of housing services and so are the primary commodities below. The dominant ownership of commercial activities is mostly private ownership. Meanwhile, the operational time in this zone ranges from 13-17 hours per day. Commercial activities have been operating between 6-10 years	Most of the commercial buildings in zone B are dominated by mixed functions,

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No	Zone	Commercial Characteristics	Space Utilization
		ago. In addition, most of the reasons for establishing a business along with the choice of location are also based on the presence and development of universities, as is the case in zone A .	namely houses and commercials.

Analysis of Changes in the Use of Residential Space to Commercial in the Jalan Kartika Area. The Jalan Kartika area has experienced the phenomenon of changes in space utilization. Some people who own land in the Jalan Kartika area have changed the function of the building into a commercial activity which was originally a house. The following is a map of changes in the use of residential space to become commercial in the Jalan Kartika Area 2003 – 2018 in Figure 5.
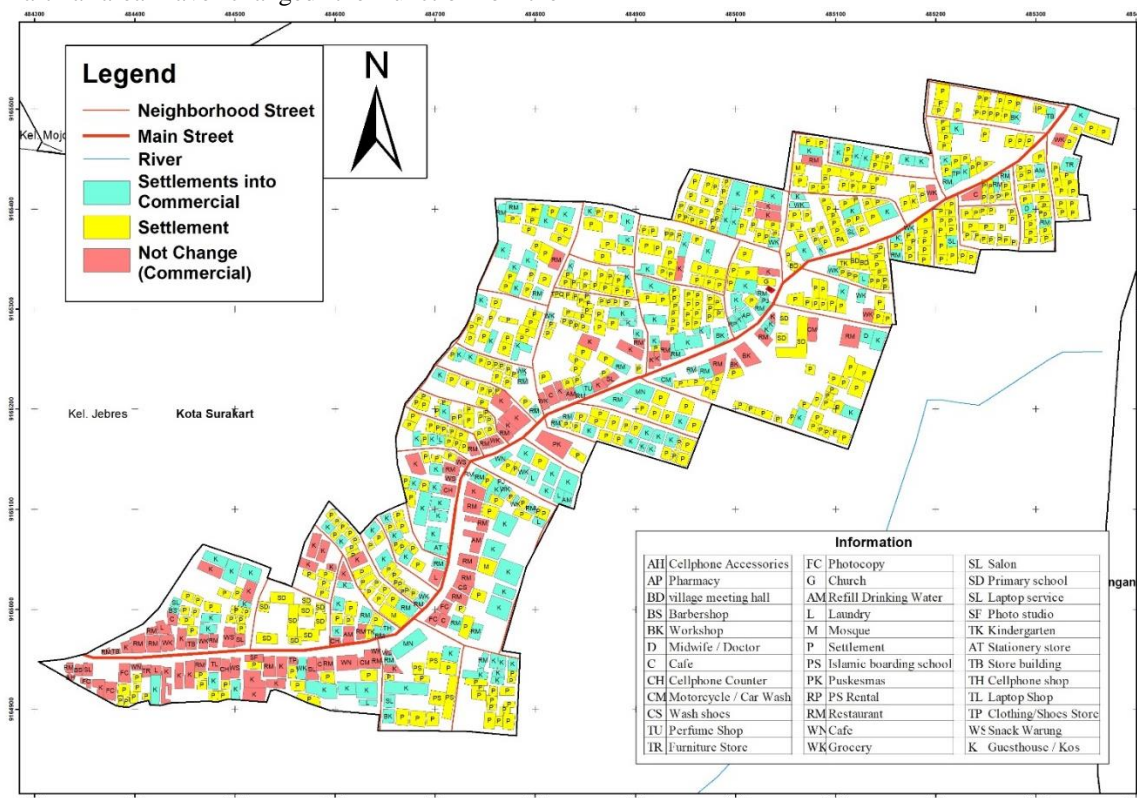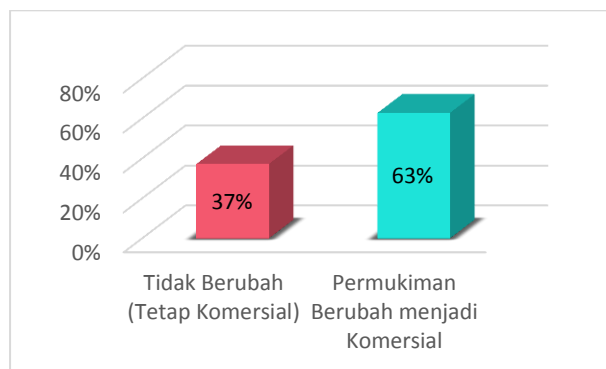

Source: Researcher Analysis, 2018

Figure 5. Map of Changes in Use of Settlement Space Becomes Commercial
in the Jalan Kartika area of 2003 - 2018

Based on the map of the above changes, it can be seen how many buildings are changed and unchanged in the Jalan Kartika area. Much changes occur when entering into settlements compared to the road corridor. Commercial activities in the road corridor have occurred a lot before even though it was also a change in settlements. Changes in space for space in the area of Jalan Kartika lead more to the function of the guesthouse / boarding room. The use of settlement spaces turned into a restaurant also happened a lot in the area. This is natural because the Kartika Street area is close to the regional education area. Wisma / boarding is much needed for temporary residential sites for rantau students, while restaurants to meet the needs of students every day. This is in line with the opinion of Verburg & Veldkamp (2004), that the utilization of the surrounding land can trigger changes in land use and the increase in land prices in the future. In a period of approximately 15 years the area of Jalan Kartika has undergone a change in the use of settlement space to be commercial as much as 63%. Based on the phenomenon that occurred in the Jalan Kartika area proving that in this region the changes that occurred quite dominantly compared to unchanged data showing a number of 37% can be seen in (Figure 6). Changes in space utilization in this region are dominated by mixed functions, namely with dwelling and commercial functions. In addition, changes that occur most commercial activities that exist are running without an official business permit or IMB. IMB which is still put in place is with a residential function or even nothing at all.

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Source: *Researcher Analysis, 2018*

Figure 6. Graph of Percentage Change in Use of

Residential Space to Commercial in the Jalan Kartika Area 2003 – 2018

Analysis of Factors Influencing the change in the use of residential space to become commercial in the Jalan Kartika area. The first analysis used descriptive statistics to see how the influence of each variable. After that, use factor analysis to find out the variables that are formed and correlated with each other into one factor of variation in the existing data. To see the effect of each variable has been determined using descriptive analysis and can be seen in Table 2 below:

Table 2.
Average Score Value of Each Variable

Variables	Mean	Influence Level	Information
Number of Students	4,88	Influential	This variable has the highest influence because the number of students in the Jalan Kartika area is an opportunity for the community to open a business
Campus Presence	4,50	Influential	Has sufficient influence because the existence of the campus triggers the development of commercial activities
The existence of boarding houses	4,15	Influential	Has a high influence because the existence of the boarding house becomes a temporary residence for students and students as the main target of commercial in the Jalan Kartika area
Strategic location	4,26	Influential	Has a high influence because the business location factor greatly affects the business affecting the number of consumers
Location Security	3,30	Quite Influential	Quite influential because most commercials require security in every business
Support Facilities and Infrastructure	3,69	Quite Influential	It is quite influential because most of the existing commercial facilities require good service facilities and infrastructure
Existence of Similar Business	2,96	Less Influential	Less influence because if there are too many similar businesses, it will increase business competition
Ease of Reaching Location	2,41	Less Influential	Not so influential because the people of the Jalan Kartika area don't pay much attention to it
Traffic Condition	1,88	Less Influential	Not so influential because Jalan Kartika is not a busy main road
Rental price	3,75	Quite Influential	Quite Influential because the price for renting space determines someone in opening a business
Land Price	3,78	Quite Influential	Influential enough because the price of land for space determines someone in opening a business

residential space to become commercial in the Jalan Kartika area is the same. The grouping of these variables is Group 1 which includes the influential variables consisting of the number of students, the existence of a campus, the existence of boarding houses, and strategic locations. Group 2 which is quite influential consists of the variables of location security, support for facilities and infrastructure, rental prices, and land prices. Group 3 which is considered less influential consists of the variables of ease of reaching the location, traffic conditions and the existence of similar businesses.

In the factor analysis that has been carried out to see the formed variables and correlated variables, it can be seen in Table 3 below:

Table 3

Naming the Variables Formed

Parameter Codes	Parameter Value				Naming the Variables Formed
	Variable 1	Variable 2	Variable 3	Variable 4	
VKP_2	0,074	**0,791**	0,251	0,236	Variable of Higher Education Existence
VKP_1	0,281	**0,752**	-0,299	0,004	
VKP_3	-0,433	**0,734**	-0,123	0,056	
VE_2	**0,902**	0,144	-0,005	0,048	Economic Variable
VE_1	**0,897**	0,094	0,125	-0,094	
VLo_1	-0,011	0,098	**0,825**	-0,062	Location Variable
VLo_3	0,313	0,497	**0,550**	0,032	
VLo_4	0,355	0,365	**0,574**	-0,019	
VLo_2	-0,205	0,304	**0,682**	0,174	
VA_2	0,064	0,027	-0,085	**0,880**	Accessibility Variable
VA_1	-0,199	0,053	0,228	**0,676**	

Notes:
1. VE_2 : Land Price
2. VE_1 : Rent Price
3. VKP_2 : University Existence
4. VKP_1 : Number of students
5. VKP_3 : Boarding house existence
6. VLo_1 : Strategic Location
7. VLo_3 : Facilities and Infrastructure Support
8. VLo_4 : Existence of Similar Business
9. VLo_2 : Location Security
10. VA_2 : Traffic Condition
11. VA_1 : Ease of Reaching Location

Based on the results of factor analysis, it can be seen that the factors that influence the change in the use of residential space into commercial activities in the Jalan Kartika area consist of 4 variables. Each parameter that makes up the variable has a constructor greater than 0.5, which indicates that each of these parameters is feasible to form a variable. There are 4 variables formed, namely the Presence of Higher Education (variable number of students, campus existence variable and the existence of boarding houses or guesthouses), Location factor (strategic location variable, location security variable, facility and infrastructure support variable and the existence of similar businesses), Accessibility factor (easy to reach location and traffic condition variable, Economic factor (land price and rental price).

The results of the factor analysis above are in accordance with the research conducted by regarding the factors that influence the use of space in the education area that the existence of universities as growth centers has a strong influence on the surrounding area. One of the visible phenomena of the Jalan Kartika area is the large number of changes in space use that trigger the growth of commercial activities of shops/shops, and mixed functions (residential and commercial) such as boarding houses, resulting in increased population density in an area (Prasetyo Samadikun et al., 2014).

If it is associated with the location factor of Von Thunen (1826), the key to location theory is the distance from the location to the market center (city center and activity center). This is in accordance with the location theory of Von Thunen (1826) which explains in substance the strategic location when viewed from the proximity to the city center and the center of population activity in the Jalan Kartika Area such as being close to the Kentingan Education Area, close to residential areas, and close to public facilities. complete. Furthermore, the accessibility factor is in line with the theory of Von Thünen (1966), where the ease of movement between locations can affect land prices. The location of the land with activity space as a residence, commercial, and other supporting facilities is supported by easy accessibility so that this ease of access has implications for increasing land prices in the Jalan Kartika area.

In addition, according to Kaiser et al., (1995) factors that can influence the development of commercial activities are economic factors, in this context land is determined by the land market in an area, thus affecting the development of commercial activities in the Jalan Kartika area. It is shown that some respondents have a perception that land prices have increased, reaching 8 million/m2-15 million/m2 due to the growing development of commercial activities to support student needs. Likewise, the rental price for land in the Jalan Kartika area is between 15 million – 50 million per year. The existence of several campuses in the Jalan Kartika area affects the price or rent of the surrounding land. This is due to the high demand for student needs such as a place to stay while studying or to support other needs, resulting in the land around the Jalan Kartika area being used for commercial activities. Although respondents on average stated that the rental price was not cheap, respondents in

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the Jalan Kartika area were still able to reach the rental price. The price of land along the corridor and in the Jalan Kartika area will continue to rise every year so that there will be many changes in the function of the building because the land owner will sell or rent a place of business to take advantage of the opportunity. Therefore, this will

IV. CONCLUSION

the settlement and is dominated by commercial activities in the form of housing services and primary commodities. The pattern of development in the Jalan Kartika area is in the form of a pattern of specialized areas or special areas where commercial activities with certain commodities are interrelated. The pattern of specialized areas is a pattern of development of economic activities that is not planned but arises because of a common interest. The Jalan Kartika area has integration, namely moving to support student needs.

Zone A is mostly used as a place of business and is dominated by primary commodities and housing services. The development in the development zone is experienced faster because it is located directly adjacent to the campus. Meanwhile, in zone B, most of the commercial buildings are used as a mixed function, namely residential and commercial and are dominated by commercial types of housing services

The Jalan Kartika area has experienced a change in the use of residential space into commercial as much as 63%, while those that have not experienced a change are 37%. Wisma/Kos are commercial activities that mostly change residential areas into commercial ones in the Jalan Kartika area. Likewise with restaurants, because basically most of the commercial activities in the Jalan Kartika area are mainly students.

Factor analysis. If you look at the level of influence, it is divided into 3 groups, namely Group 1 which includes the influence of variables, the number of students, the existence of a campus, the existence of a boarding house, and. group 2 which is quite influential consists of the variables of location security, support for facilities and infrastructure, rental prices, and land prices. Group 3 which is considered less influential consists of the variables of ease of reaching the location, traffic conditions and the existence of similar businesses. Meanwhile, if grouping based on correlations between variables in the sense that it is based on the ability of these variables to explain relatively the same data variations, 4 factors are formed, namely the presence of higher education (variable number of students, variable of campus existence and variable of existence of boarding houses or guesthouses), location factor (strategic location variable, location security variable, facility and infrastructure support variable and the existence of similar businesses), accessibility factor (easy to reach location variable and traffic condition variable, economic factor (land price and rental price).

affect the increase in the value of land in the Jalan Kartika area and its surroundings, especially land that has a strategic location and the high and low prices or land rents in the Jalan Kartika area will affect the commercial activities in it.

There are differences that occur in the

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