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The Effect Of Road Connectivity And Smooth Transportation On Regional Development In Medan Tuntungan, North Sumatra

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Abstract
The study aims to analyze the influence of road connectivity and smooth transportation to the development in Medan Tuntungan. The research method is quantitative descriptive with a survey approach. The research variables used are the variables of road connectivity, smooth transportation and regional development. Data obtained from 100 respondents who live in Medan Tuntungan through a questionnaire. Data analysis method is carried out through multiple linear regression analysis. The results showed that road connectivity and smooth transportation had a positive and significant effect on the development of Medan Tuntungan.
Keywords: Road Connectivity, Smooth Transportation and Regional Development

Introduction

Medan Tuntungan Subdistrict is one of the sub-districts in Medan City, with an area of 29.87 km2. The sub-district located in the south of Medan City is the entrance of Karo Regency and other areas in North Sumatra such as Nangro Aceh Darussalam Province by land transportation. This sub-district also has the completeness of the availability of road functions, ranging from arteries, collectors, local roads and neighborhood roads with the status of road management from the city level to the national level (Medan Tuntungan Dalam Angka 2017).

Based on data from the Public Works Department of Medan City, in 2016 the total length of roads in the Medan Tuntungan Subdistrict reached 92.02 km consisting of 7.60 km National Road, 8.72 km Provincial Road and 82.80 km of City Road , where 50.19% is in good condition while the remaining 31.58% is in medium condition and 18.23% is in damaged condition. Of the total road length 92.31% is paved roads, 3.93% concrete roads and 3.36% are earthen roads. Of all the roads, several local roads have been interconnected with various collector and arterial roads with varying lengths and widths.

Statement of the Problem

Is there any influence of road connectivity and smooth transportation to the development of Medan Tuntungan?

Objectives of the Study

Analyzing the influence of road connectivity and smooth transportation to the development of Medan Tuntungan.

Research Methodology

The research method used is a survey with descriptive explanations. The approach taken in this study is quantitative / associative / correlational, data analysis using inferential statistics to determine the degree of relationship and the form of influence between independent variables with the dependent variable. because this study aims to determine the relationship between two or more variables. The sampling technique used is probability sampling

Table 1. Population and Sample per Village

No.	Sub-district	Population (Household)	Sample (Household)
1.	Baru Ladang Bambu	949	949 / 20.051 x 100 = 5
2.	Sidomulyo	449	449 / 20.051 x 100 = 2
3.	Lau Cih	568	568 / 20.051 x 100 = 3
4.	Namu Gajah	490	490 / 20.051 x 100 = 2
5.	Kemenangan Tani	1.322	1.322 / 20.051 x 100 = 7
6.	Simalingkar B	1.380	1.380 / 20.051 x 100 = 7
7.	Simpang Selayang	4.510	4.510 / 20.051 x 100 = 22
8.	Tanjung Selamat	2.904	2.904 / 20.051 x 100 = 14
9.	Mangga	7.479	7.479 / 20.051 x 100 = 38
	Total	20.051	100

Source: Medan Central Statistics Agency, 2017

Data collection techniques used are library studies, observation, interviews. In giving weight and scoring a Likert scale is used. To test the validity using product moment correlation and reliability testing with Cronbach's Alpha. Quantitative descriptive analysis was carried out with the help of frequency distribution tables where the answer criteria with the highest frequency of occurrence were considered as the dominant criteria for other criteria, so that it could be known the influence of road connectivity on the smoothness of transportation in the development of Medan Tuntungan.

Literature Review

Principles of urban and regional planning and sustainable economic growth need the role of the Regional Government in preparing sufficient space for the highway, in order to develop a safe, comfortable and efficient road network, which allows a high level of connectivity and supports transportation, in order to improve economic productivity and facilitate local economic growth (Wagai J, 2016)

The road network system is a unit that connects and connects growth centers with areas that are under the influence of their services in a hierarchical relationship (Law No.38 of 2004). The road network can be interpreted as a collection of road routes that connect between various nodes or growth centers (Atmoko, 2014). A reliable, steady and integrated road network will support the development of regions that facilitate the mobility of goods and people so that the pace of the economy continues to develop (PKPT PU, 2017).

The road network is a major infrastructure system that is part of the land transportation network system. The road network is also referred to as a driving force for regional economies, because it can increase economic growth and reduce disparities between regions as stated by Afriansyah (2001).

Roads as one of the transportation infrastructure for the life of the nation, the position and role of the road network are essentially related to the lives of many people and control the structure of regional development at the national level, especially concerning the realization of balanced inter-regional development and equitable development outcomes, as well as increasing defense and state security in implementing long-term development plans and medium-term development plans towards a just and prosperous Indonesian society based on Pancasila and the 1945 Constitution.

According to Tamin O.Z. (2000), the system of transportation infrastructure and facilities as a basic infrastructure is a prerequisite for regional economic development, where the support system and the driving force of transportation infrastructure play an important role in the efficiency and effectiveness of regional economic activities.

Result

Table 2. Validity and Reliability Test Results for Road Connectivity, Transportation Smoothness and Regional Development Variables

Variable	Questionnaire Item	r-statistic	r-table	Description	Alpha coefficient
Road Connectivity	1	0,798	0.361	Valid	0,901
	2	0,522	0.361	Valid	
	3	0,760	0.361	Valid	
	4	0,682	0.361	Valid	
	5	0,758	0.361	Valid	
	6	0,659	0.361	Valid	
	7	0,659	0.361	Valid	
	8	0,649	0.361	Valid	
	9	0,775	0,361	Valid	
	10	0,682	0,361	Valid	
	11	0,682	0,361	Valid	
	12	0,602	0,361	Valid	
	13	0,608	0,361	Valid	
Smooth Transportation	1	0,815	0.361	Valid	0,896
	2	0,593	0.361	Valid	
	3	0,640	0.361	Valid	
	4	0,445	0.361	Valid	
	5	0,641	0.361	Valid	
	6	0,731	0.361	Valid	
	7	0,545	0.361	Valid	
	8	0,602	0.361	Valid	
	9	0,616	0.361	Valid	
	10	0,640	0.361	Valid	
	11	0,446	0.361	Valid	
Regional Development	1	0,852	0.361	Valid	0,906
	2	0,797	0.361	Valid	
	3	0,975	0.361	Valid	
	4	0,416	0.361	Valid	
	5	0,575	0,361	Valid	
	6	0,786	0,361	Valid	
	7	0,907	0,361	Valid	
	8	0,852	0,361	Valid	

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Source: Primary data processed (2018)

Based on the results of the validity test, it can be concluded that all the variables of road connectivity, smooth transportation and area development are valid, it can be seen that r-count is greater than r-table. The results of data testing showed that the value of cronbach's alpha was> 0.6. This shows that research data is reliable.

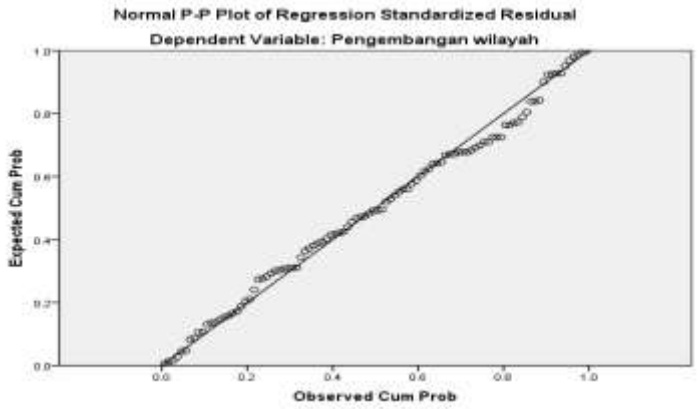

Figure 1. Normal P-Plot of Regression Standardized Residual from the Development of the Medan Tuntungan

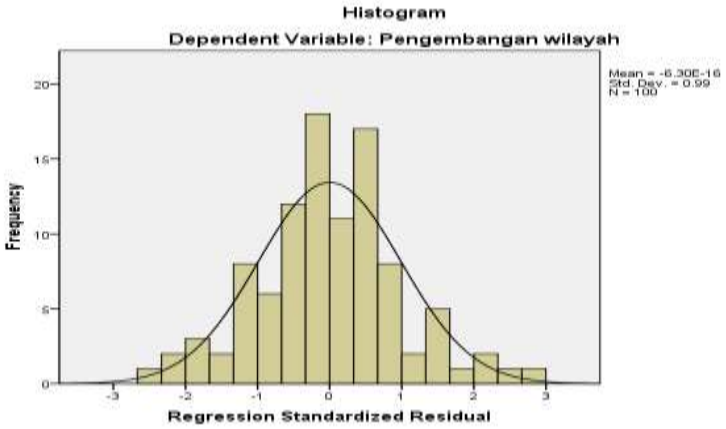

Figure 2. Medan Tuntungan Development Histogram

Normal Graphic plot in Figure 2, it can be concluded that the data spread around the diagonal line and follow the direction of the diagonal line. This shows that residual data is normally distributed. Likewise with the results of the histogram graph in Figure 2. which shows that the residual data is normally distributed as seen from the almost perfect (symmetrical) bell-shaped image.

Table 3. Results of Kolmogorov - Smirnov Test

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		Unstandardized Residual
N		100
Normal Parameters[a,,b]	.0000000	.0000000
	1.53048291	.82491389
Most Extreme Differences	.073	.066
	.073	.053
	-.051	-.066
Kolmogorov-Smirnov Z		.729
Asymp. Sig. (2-tailed)		.662

a. Test distribution is Normal.

b. Calculated from data.

Source: Primary Data Processed, 2018

Statistical test results in Table 3. show that the Kolmogorov-Smirnov Z value is 0.729 and its significance is 0.662 and the value is above α = 0.05 (Asymp.Sig = 0.662> 0.05) so that the Ha hypothesis is accepted which means that the residual data is normally distributed . The analysis results can be seen that the VIF and tolerance values are as follows: the road connectivity variable has a VIF value of 2.945 and tolerance of 0.340. The smooth transportation variable has a VIF value of 2.945 and tolerance of 0.340. The results of this analysis show that the tolerance values of both the independent variables (road connectivity and smooth transportation) are more than 0.10 and the VIF value is less than 10 so it can be concluded that the independent variables are not multicollinearity so that the model has fulfilled the classical assumption requirements in regression analysis. From the existing provision that if the VIF value is <10 and tolerance> 0.10, there is no multicollinearity symptom and the values obtained from the calculation are in accordance with the provisions of VIF and tolerance values.

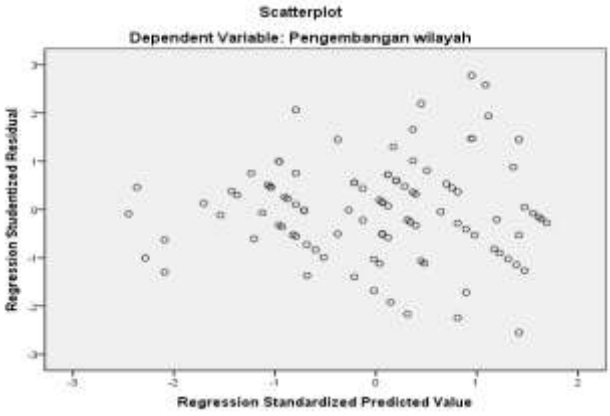

Figure 3. Graph of Medan Tuntungan Development Scatterplots

The scatterplots graph in Figure 3. shows that the points spread randomly and spread both above and below the 0 on the Y axis and do not form a regular pattern, so it can be concluded that there is no heterocedasticity in the regression model. It can be concluded that the regression

model fulfills the classical assumption test requirements.

Table 4. Coefficient of Determination of the Effect of Road Connectivity and Smoothness Transportation to the Development of Medan Tuntungan

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.826[a]	.682	.676	1.54618

a. Predictors: (Constant), Kelancaran Transportasi, Konektivitas Jalan

b. Dependent Variable: Pengembangan Wilayah

Source: Primary Data Processed, 2018

Table. 5. Simultaneous Test Results of the Effect of Road Connectivity and Smoothness Transportation to the Development of Medan Tuntungan

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	497.665	2	248.832	104.085	.000[a]
	Residual	231.895	97	2.391		
	Total	729.560	99			

a. Predictors: (Constant), Kelancaran Transportasi, Konektivitas Jalan

Source: Primary Data Processed, 2018

Simultaneous statistical tests can be seen from the probability level of 0,000. which is $<\alpha = 0.05$, which means Ha is accepted. This means that the independent variables (road connectivity and smooth transportation) are simultaneously significant in explaining the development of Medan Tuntungan.

Table 6. Partial Test Results on the Effect of Road Connectivity and Smoothness Transportation to the Development of Medan Tuntungan

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	6.098	1.649		3.698	.000
	Konektivitas Jalan	.185	.056	.327	3.332	.001
	Kelancaran Transportasi	.310	.057	.538	5.472	.000

a. Dependent Variable: Pengembangan Wilayah

Source: Primary Data Processed, 2018

In Table 6, partial test results, as follows:

1. Road connectivity variables have a significant positive effect on the development of Medan Tuntungan.
2. The smooth transportation variable has a positive effect on the development of the Medan Tuntungan.

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Berdasarkan Tabel 6, dapat disusun persamaan regresi berganda sebagai berikut :

$$Y = 6{,}098 + 0{,}185\ X_1 + 0{,}310\ X_2$$

The multiple regression equation model explains:

1. The constant value is 6.098 which means that if there is no independent variable value, in this case road connectivity and smooth transportation are equal to 0 (zero) then the value of the Medan Tuntungan development will be 6.098 score units.
2. Road connectivity variable (X1) has a beta coefficient of 0.185 with a positive sign, this means that each increase in one score unit of the road connectivity variable will add value to the development of the Medan Tuntungan of 0.185 score units.
3. The smooth transportation variable (X2) has a beta coefficient of 0.310 which is positive, this means that each increase in one score of the smooth transportation variable will increase the value of the Medan Tuntungan development by 0.310 score units.

Discussion

The results of descriptive road connectivity analysis show that on average respondents answered agree with the links and nodes. Links include road surfaces asphalt / concrete, good road conditions, short distance of travel destinations, connected / interconnected roads, road capacity capable of servicing vehicle volumes, travel frequencies 5-6 times a week and road travel functions in part on environmental roads and local. What becomes a Node is a work / business / school trip, more accessible, where the strategic nodes are located and other alternative routes are available in traveling to the nodes.

The results of the transportation smoothness analysis in a descriptive manner show that on average respondents answered agree with effective transportation performance and efficient transportation performance. Effective transportation performance can be seen from the safety and avoidance of transportation accidents due to internal factors, high accessibility because the transportation service network can reach the widest possible area, the intramodal and intermodal integration in the network of transportation infrastructure and services and the capacity of transportation facilities and infrastructure are sufficient to meet demand for transportation service users. Efficient transportation performance is seen from a regular, smooth and fast, easy to reach nodes, on time, comfortable, orderly, safe and low air pollution.

Road connectivity has a positive and significant effect on the development of Medan Tuntungan, with a regression coefficient of 0.185 and having a unidirectional effect, any addition or increase of one unit of road connectivity score will increase the value of the development of 0.185 score units.

The smoothness of transportation has a positive and significant effect on the development of Medan Tuntungan, with a regression coefficient of 0.310 and having a unidirectional effect which means that each addition or increase in one unit of

smooth transportation score will increase the area development value by 0.310 score units. It is estimated that with the increasing smoothness of transportation, the development of Medan Tuntungan will also increase.

Conclusion

Road connectivity and smooth transportation have a positive and significant effect on the development of the Medan Tuntungan.

Suggestion

The Medan City Government needs to compile a map of the transportation of Medan Tuntungan and connect it to other areas that have high economic potential.

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