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The Effect of Road Transportation Infrastructure on Freight Transport Mobility and Regional Economy in Indonesia

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Abstract

This research aims to examine the influence of road transportation infrastructure on the mobility of goods transport and the regional economy in Langkat Regency in Indonesia. This type of research is an associative and explanatory research whose data is obtained through a questionnaire survey. This study took a sample of 305 respondents using probability sampling in Langkat Regency, North Sumatera, Indonesia. Data analysis techniques use path analysis. The research results showed that the road transportation infrastructure variables had a significant and positive effect on the mobility of goods transport. Road transportation infrastructure and freight mobility simultaneously have a significant and positive effect on the economy of Langkat Regency. Road transportation infrastructure with the dimensions of road accessibility and maintenance partially directly has a significant and positive effect on the economy of the Langkat Regency. Road transportation infrastructure with the dimensions of road design and road construction quality partially does not have a direct effect on the regional economy, but has a positive and significant effect through the mobility of freight transport. The mobility of goods transport becomes an intervening variable that acts to mediate or determine the relationship between road transportation infrastructure variables to the regional economy.

Keywords: Road Transportation Infrastructure, Freight Mobility, Regional Economy

JEL Classification Code: H54, L92, P25

1. Introduction

Langkat Regency is a center for agricultural production of food crops, livestock, plantations, fisheries and mining. Gross Regional Domestic Product (PDRB) at the Valid Price (ADHB) in 2018 is IDR39,818.55 billion. The agricultural sector as the main contributor in the formation of GRDP of Langkat Regency, amounting to 38.9 percent, is dominated by plantation products such as oil palm and rubber, then food crops such as rice, secondary crops and horticulture (Langkat Regency in Figures 2018). The position of Langkat Regency as a production center for food crops, livestock, plantation, fishery and mining agriculture is in line with the third position as the area that generates the most and attracts the transportation of goods in the province of North Sumatra (Ministry of Transportation, Republic of Indonesia, 2016), directly proportional to the level of welfare of the people of Langkat Regency. The welfare indicators for the people of Langkat Regency in 2018 include: population, health, education, employment, levels and patterns of consumption, housing, and poverty show that welfare of the people of Langkat district has not been achieved (Langkat Regency People's Welfare Indicator, 2018). The number of poor people in Langkat Regency has increased from 2012 to 2016. In 2018, the percentage of poor people in Langkat Regency was 105,460 people or 10.20 percent of the total population decreased slightly compared to 2017, which was 114,410 people or 11.15. percent, but higher than North Sumatra Province, which reached 9.22 percent. The economic growth rate of Langkat Regency from 2012 to 2016 has decreased every year and is below the average of North Sumatra Province. In 2017, the economic growth rate of Langkat

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Regency increased by 5.05 percent, but in 2018 it decreased to 5.02 percent, still below North Sumatra Province by 5.18 percent (Central Bureau of Statistics, 2018).

Currently, the various potentials available cannot be cultivated optimally, so there is still a need for hard work through the touch of synergistic programs so that this potential can be utilized. One of the strategic issues in the regional development of Langkat Regency, stated in the Regional Spatial Plan (RTRW) of Langkat Regency for 2013–2033, is the lack of connectivity between district development areas so that regional development in Langkat Regency is uneven and dependence between regions is not served (Bappeda of Langkat Regency, 2013). In addition to connectivity issues, the quality of construction and road surface in Langkat Regency is a strategic issue that requires the attention of the Regional Government in accelerating the mobility of goods transportation to transport goods produced by the region and distributing goods needed by the community in order to increase regional economic growth (Tarmizi et al., 2017). The low level of accessibility and mobility of goods transportation results in low use value of regional commodities and disparity in prices for basic necessities of the community (Langkat Regency Transportation Office, 2017).

2. Literature Review

2.1. Regional Economy

The regional dimension is very important and is a factor that must be taken into account in analyzing and determining where a project is placed in development planning. The area is connoted with the location of a development activity or economic activities such as industry or factories, companies, and service facilities (Adisasmita, 2008; Kim & Kim, 2020). There are two ways to increase the economic level of a region. The first is by boosting the economic growth of a region, henceforth the government can get additional taxes from economic activities in an already developed region (Muda et al., 2018). The tax is then used to develop areas that have been deemed underdeveloped. The second way is to increase the efficiency of logistics flows within a region. This is mainly related to the easy access of underdeveloped regions to regions with developed economies (Susantono, 2012). There are three interrelated components in regional development to support the development of a region, namely, (1) population resources, (2) economic activity, and (3) transportation system (Meyer et al., 1984).

The transportation sector is an important component in the economy, which affects the development and welfare of society when the transportation system runs efficiently. The transportation system is able to provide socio-economic opportunities and benefits that produce a positive multiplier effect in the form of access to markets, labor and encouraging new investment (Castanho et al., 2020; Muafi, 2020; Sadalia et al., 2020). The impact of the transportation sector on regional development is caused by a fundamental aspect called mobility. High mobility will encourage economic growth through the transportation industry mechanism (Rodrigue, 1998). The growth and development of an area can be analyzed using a transportation approach, where a good transportation system will create regional thrust and attractiveness in various investment activities and economic activities of the people in the region. In other words, a disruption in the regional transportation system will hamper the mobility of investment and economic activities of the community (Black, 1981). Transportation infrastructure and facilities as basic infrastructure are prerequisites for the occurrence of regional economic movements, in which the supporting and driving systems for transportation infrastructure play a major role in the efficiency and effectiveness of regional economic activities (Tamin, 2000). Transportation is an activity that creates or adds use (utility). The use created by transportation activities is to use place (place utility) and use time (time utility). Nasution (2015) states that the context of creating or adding a transportation utility to provide transportation services through the provision of types of equipment constitutes the elements of transportation: (1) operation equipment, which is often referred to as transportation means, in the form of equipment used to transport goods and passengers driven by motorized engines or other driving forces, and (2) basic facilities, which are called transportation infrastructure, consists of two types, roads and terminals.

2.2. Road Transportation Infrastructure

The ease of reaching the locations of economic facilities and community services is obtained by creating accessibility through road construction. Roads are transportation infrastructure in land transportation (Adisasmita, 2012). However, the existence of a road network alone is not sufficient to support the economic growth of a region, the condition of the road network system must also be considered (Nasution et al., 2018). The better the condition of the road network system in an area, the better the level of connectivity, which means that the connection between regions will be easier. The higher the level of connectivity, it can be seen from the shorter the travel distance and the route that becomes the choice in taking the destination is increasing, thus allowing direct trips to the destination area and are easier to reach/access (Victoria Transport Policy Institute, 2020). Road infrastructure investment has a direct impact on users (direct users), such as reducing travel time and reducing transportation costs (Perera et al., 2020). Investment in the transportation sector can also provide economic benefits that can be felt by the production sector in the region (direct economic benefits), these benefits include a reduction in the cost of transportation of goods, greater operating scale and accessibility economies (Weisbrod & Treyz, 1998; Potluri & Tejaswi, 2018). The development of road transportation infrastructure and facilities has a direct impact on the welfare of the community by creating jobs to reduce poverty levels (Susantono, 2013). Quality road infrastructure affects the accessibility and mobility of a region's development (Wahab, 2009).

2.3. Freight Transport Mobility

The purpose of a general goods transportation system is to ensure the availability of goods for the production and consumption process in various places, provide convenience and natural resource needs, and meet the needs of consumers and producers for goods. The main function of the goods transportation system, among others, is to promote economic growth. Schumer (1986) stated that the quality of goods transportation services is cultivated are speed, safety, adequacy, frequency, regularity, responsibility and acceptable cost/affordable price. The quality of goods transportation services can be obtained if the mobility of goods transportation is good. Mobility can be defined as the level of smoothness of the trip, and can be measured by the number of trips (movements) from one location to another as a result of the high level of access between these locations (Tambunan et al., 2018; Cui et al., 2020). That means, between accessibility and mobility there is a unidirectional relationship, namely, the higher the access, the higher the level of mobility of people, vehicles or goods moving from one location to another (Miro, 2012; Ramadania et al., 2020). High mobility reflects smooth distribution as well as the time it takes to process materials and move them from places where they are less useful to locations where the benefits are greater the faster. The higher the mobility, the higher the productivity (Nasution, 2015).

3. Methods

The research was conducted in the Langkat Regency area. The study population were residents of Langkat Regency who worked as drivers of goods vehicles. Determination of the number of samples using the Slovin formula (Umar, 2004) is as follows:

$$n = \frac{N}{1 + (Nd^2)}$$

Where:
N = population
n = sample
d = alpha

So that lots of samples:

$$n = \frac{1.286}{1 + (1.286 \times 0,5^2)} = 305$$

In this study, the research instrument used was a questionnaire. To calculate the validity of the instrument, the assistance of the IBM SPSS Statistics 22 program was used. The SPSS output display shows that between each indicator score against the total indicator score of each variable a significant value is obtained < 0.05 and the correlation between the indicator score and the total indicator score is above 0.3, while the Cronbach's alpha value is greater than 0.6. So, it can be concluded that each question indicator for the research variable is valid and reliable (Ghozali, 2006). The data analysis technique used path analysis. Path analysis is a technique for analyzing the causal relationship that occurs in multiple regression if the independent variable affects the dependent variable not only directly, but also indirectly (Retherford, 1993). The path analysis model is only suitable for data that meets the assumptions applicable to regression analysis, including (1) minimum observation variable with interval scale, (2) there is only one causal direction in the model, and (3) test for classical assumptions deviations. Path analysis is a development technique of linear regression; the problems that can occur in linear regression models must be avoided (Indrayani et al., 2019). There are several problems that can occur in the linear regression model that statistically these problems can interfere with the predetermined model, and can even mislead the conclusions drawn from the equations formed, it is necessary to test classical assumptions which include normality testing,

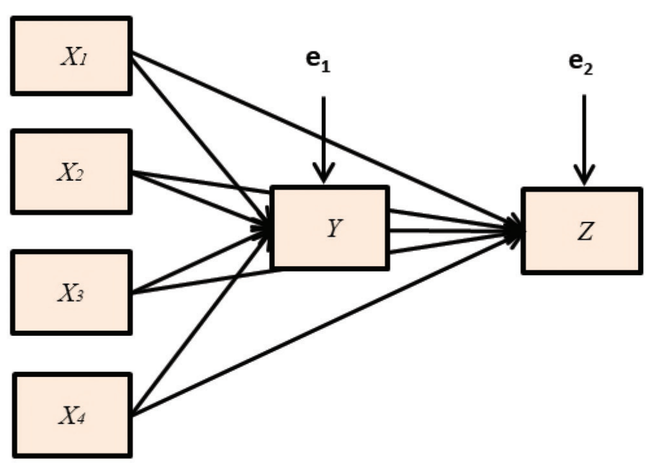

Figure 1: Path Analysis Model

Where:

Exogenous variables	Endogenous variables
X_1: Accessibility	Y: Freight Transport Mobility
X_2: Street Design	Z: Regional Economy
X_3: Road Construction Quality	e_1: Effect of residual variables on Y
X_4: Road Maintenance	e_2: Effect of residual variables on Z

with the structural equation as follows:

$$Y = \rho YX_1 + \rho YX_2 + \rho YX_3 + \rho YX_4 + e_1 \quad \text{(Model I)}$$

$$Z = \rho ZX_1 + \rho ZX_2 + \rho ZX_3 + \rho ZX_4 + \rho ZY + e_2 \quad \text{(Model II)}$$

4. Results

4.1. Classic Assumption Test

The data normality test using the Kolmogorov-Smirnov test obtained the Asymp.Sig. (2-tailed) value of $0.200 > 0.05$, meaning that the data were normally distributed. Testing multicollinearity symptoms by looking at the VIF (Variance Inflation Factor) value, the multicollinearity test results show that each variable has a VIF value much less than 10, so in the regression model there are no multicollinearity symptoms. Linear regression model assumes that the residual variance is constant or the same for various observations. Heteroscedasticity symptom testing uses the Glesjer method (Glesjer Test) by making a regression model between the absolute value of the residuals as the dependent variable on all independent variables at the 95% confidence level (α = 0.05). The results of the heteroscedasticity test can be seen that all independent variables have a significance value greater than α = 0.05 so that the independent variables do not have a significant effect on the absolute residuals so that, meaning that constant residuals are not influenced by changes in the independent variables so that in the regression model heteroscedasticity does not occur. The Durbin Watson test results obtained a value of d = 1.904, because the Durbin Watson value is close to 2, it can be concluded that there are no autocorrelation symptoms in the regression model.

4.1.1. Regression and Correlation Models

Structural Equations Model I

The amount of the R square number (r^2) is 0.792. The magnitude of the influence of Accessibility (X_1), Street Design (X_2), Road Construction Quality (X_3), and Road Maintenance (X_4) on Freight Transport Mobility (Y) by calculating the coefficient of determination (KD) using the following formula:

$$\text{KD} = r^2 \times 100\%$$
$$\text{KD} = 0.792 \times 100\%$$
$$\text{KD} = 79.2\ \%$$

This figure means that the effect of the variable Accessibility (X_1), Road Design (X_2), Quality of Road Construction (X_3), and Road Maintenance (X_4) on the Mobility of Goods Transportation (Y) is 79.2%, while the remaining 20.8% (100% – 79.2%) was influenced by other factors. In other words, the variability of Freight Transport Mobility (Y), which can be explained using the variables of Accessibility (X_1), Road Design (X_2), Road Construction Quality (X_3), and Road Maintenance (X_4) was 79.2%, while the effect was 20.8% is caused by other variables outside this model. To determine the feasibility of the regression model, the figures are drawn from Table 1.

From the ANOVA Table 1 output, it is known that the Fcount value is 285.486 with a significant level of $0.000 < 0.05$, so the regression model can be used to predict the Freight Mobility variable (Y). To see the magnitude of the influence of the variables of Accessibility (X_1), Road Design (X_2), Road Construction Quality (X_3), and Road Maintenance (X_4) on Freight Transport Mobility (Y) individually (partially) the T Test is used. To see the magnitude of the effect, the Beta or Standardized Coeffecients below are used.

Table 1: ANOVA Test

Model		Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	36773.245	4	9193.311	285.486	.000[b]
	Residual	9660.703	300	32.202		
	Total	46433.948	304			

a. Dependent Variable: Mobility of Freight Transport.
b. Predictors: (Constant), Road Maintenance, Road Design, Accessibility, Road Construction.

Table 2: *t* Test

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
		B	Std. Error	Beta		
1	(Constant)	12.598	1.692		7.445	0.000
	Accessibility	1.322	0.131	0.405	10.099	0.000
	Road Design	1.371	0.152	0.319	9.000	0.000
	Road Construction	0.345	0.145	0.104	2.382	0.018
	Road Maintenance	1.037	0.246	0.199	4.224	0.000

a. Dependent Variable: Mobility of Freight Transport.

The regression analysis conducted in Table 2 shows the following:

1. The significant value of the accessibility variable (X_1) 0.000 <0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the variable accessibility (X_1) partially affects the variable mobility of goods transportation (Y). While the coefficient value of the Accessibility variable path (X_1) is 0.405.
2. The significant value of the Road Design variable (X_2) is 0.018 <0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the Road Design variable (X_2) partially affects the Freight Transport Mobility variable (Y). While the coefficient value of the Road Design variable (X_2) is 0.319.
3. The significant value of the Road Construction Quality variable (X_3) 0.000 <0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the variable Road Construction Quality (X_3) partially affects the Freight Transport Mobility variable (Y). Meanwhile, the path coefficient value of the Road Construction Quality variable (X_3) is 0.104.
4. The significant value of the Road Maintenance variable (X_4) 0.000 <0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the variable road maintenance (X_4) partially affects the variable mobility of goods transportation (Y). Meanwhile, the road maintenance variable path coefficient (X_4) is 0.199.

Structural Equations Model II

To see the effect of variables of Accessibility (X_1), Road Design (X_2), Road Construction Quality (X_3), Road Maintenance (X_4) and Freight Transport Mobility (Y) on the Regional Economy (Z) together (simultaneously), the results can be seen. Calculations in the Summary model, especially the R square number in Table 3.

Table 3: Summary Model for Model II

Model	*R*	*R* Square	Adjusted *R* Square	Std. Error of the Estimate
1	0.901[a]	0.812	0.809	5.182

a. Predictors: (Constant), Mobility of Freight Transport, Road Construction, Road Design, Accessibility, Road Maintenance.

Table 4: ANOVA Test for Model II

Model		Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	34622.178	5	6924.436	257.847	0.000[b]
	Residual	8029.593	299	26.855		
	Total	42651.770	304			

a. Dependent Variable: Regional Economy.
b. Predictors: (Constant), Mobility of Freight Transport, Road Construction, Road Design, Accessibility, Road Maintenance.

The magnitude of the number R square (r_2) is 0.809. This figure means that the effect of the variables of Accessibility (X_1), Road Design (X_2), Quality of Road Construction (X_3), Road Maintenance (X_4) and Mobility of Freight Transport (Y) on the Regional Economy (Z) is 80.9% combined, while the remaining 19.1% was influenced by other factors. In other words, the variability of the Regional Economy (Z), which can be explained using the variables of Accessibility (X_1), Road Design (X_2), Quality of Road Construction (X_3), Road Maintenance (X_4) and Mobility of Freight Transport (Y) is 79.2%, while the influence of 19.1% was caused by other variables outside this model. To determine the feasibility of the regression model, the figures are drawn from Table 4.

From the ANOVA table output, it is known that the F count value is 257,847 with a significant level of 0.000 <0.05, so the regression model can be used to predict the Regional Economy variable (Z). To see the magnitude of the influence of the variables of Accessibility (X_1), Road Design (X_2), Quality of Road Construction (X_3), Road Maintenance (X_4) and Freight Transport Mobility (Y) on the Regional Economy (Z) individually (partially) used Test Q. Meanwhile, to see the magnitude of the effect, the Beta or Standardized Coeffecients below are used.

The regression analysis conducted in Table 5 shows the following:

1. The significant value of the accessibility variable (X_1) is 0.016 <0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the accessibility variable (X_1) partially affects the Regional Economy variable (Z). While the coefficient value of the Accessibility variable path (X_1) is 0.107.
2. The significant value of the Road Design variable (X_2) is 0.265 > 0.05, so Ha is rejected and Ho is accepted at a significant level of 5%. Thus, it can be concluded that there is no linear relationship between the Road Design variable (X_2) and the Regional Economy (Z). The value of the path coefficient of 0.042 or the effect of Road Design (X_2) of 4.2% on the Regional Economy (Z) is partially considered insignificant
3. The significant value of the Road Construction Quality variable (X_3) is 0.097 > 0.05, so Ha is rejected and Ho is accepted at a significant level of 5%. Thus, it can be concluded that there is no linear relationship between the variable road construction quality (X_3) and the regional economy (Z). The value of the path coefficient of 0.070 or the effect of Road Construction Quality (X_3) of 7% on the Regional Economy (Z) is partially considered insignificant.
4. The significant value of the Road Maintenance variable (X_4) 0.000 < 0.05, so Ha is accepted and Ho is rejected at a significant level of 5%. Thus, it can be concluded that the Road Maintenance variable (X_4) partially affects the Regional Economy variable (Z). Meanwhile, the road maintenance variable path coefficient (X_4) is 0.268.
5. The significant value of the Freight Transport Mobility variable (Y) 0.000 < 0.05, so Ha accepted and Ho rejected at a significant level of 5%. Thus, it can be concluded that the variable freight transport mobility (Y) partially affects the regional economy variable (Z). While the value of the variable path coefficient of Freight Transportation Mobility (Y) is 0.497.

4.2. Influence Calculation

4.2.1. Direct Effect

To calculate the direct effect, the following formula is used:

1. Effect of Accessibility (X_1) on Mobility of Goods Transportation (Y)

$$X_1 \rightarrow Y = 0.405$$

2. Effect of Road Design (X_2) on Mobility of Freight Transportation (Y)

$$X_2 \rightarrow Y = 0.319$$

3. The Effect of the Quality of Road Construction (X_3) on Mobility of Freight Transportation (Y)

$$X_3 \rightarrow Y = 0.104$$

4. The Effect of Road Maintenance (X_4) on Mobility of Goods Transportation (Y)

$$X_4 \rightarrow Y = 0.199$$

5. The Effect of Accessibility (X_1) on the Regional Economy (Z)

$$X_1 \rightarrow Z = 0.107$$

6. The Effect of Road Maintenance (X_4) on the Regional Economy (Z)

$$X_4 \rightarrow Z = 0.268$$

7. The Effect of Freight Transport Mobility (Y) on the Regional Economy (Z)

$$Y \rightarrow Z = 0.497$$

Table 5: *t* Test

Model		Unstandardized Coefficients		Standardized Coefficients	*t*	Sig.
		B	**Std. Error**	**Beta**		
1	(Constant)	19.726	1.682		11.728	0.000
	Accessibility	0.335	0.138	0.107	2.421	0.016
	Road Design	0.175	0.157	0.042	1.117	0.265
	Road Construction	0.222	0.134	0.070	1.666	0.097
	Road Maintenance	1.340	0.231	0.268	5.806	0.000
	Mobility of Freight Transport	0.476	0.053	0.497	9.026	0.000

a. Dependent Variable: Regional Economy.

4.2.2. Indirect Effect

To calculate the indirect effect, the following formula is used:

1. The influence of the Accessibility variable (X_1) on the Regional Economy (Z) through the Mobility of Freight Transport (Y)

$$X_1 \rightarrow Y \rightarrow Z = (0.405 \times 0.497) = 0.201$$

2. The influence of the Road Design variable (X_2) on the Regional Economy (Z) through the Mobility of Freight Transport (Y)

$$X_2 \rightarrow Y \rightarrow Z = (0.319 \times 0.497) = 0.159$$

3. The influence of the Road Construction variable (X_3) on the Regional Economy (Z) through the Mobility of Freight Transport (Y)

$$X_3 \rightarrow Y \rightarrow Z = (0.104 \times 0.497) = 0.052$$

4. The influence of the road maintenance variable (X_4) on the regional economy (Z) through the mobility of goods transportation (Y)

$$X_4 \rightarrow Y \rightarrow Z = (0.199 \times 0.497) = 0.099$$

4.2.3. Total Effect

1. The influence of the Accessibility variable (X_1) on the Regional Economy (Z) through the Mobility of Goods Transportation (Y)
2. The influence of the Accessibility variable (X_1) on the Regional Economy (Z)

$$X_1 \rightarrow Y \rightarrow Z = (0.405 + 0.497) = 0.902$$

3. Effect of the Road Design variable (X_2) on Regional Economy (Z) through Freight Transport Mobility (Y)

$$X_2 \rightarrow Y \rightarrow Z = (0.319 + 0.497) = 0.816$$

4. The influence of the Accessibility variable (X_1) on the Regional Economy (Z) through the Mobility of Freight Transportation (Y)

$$X_3 \rightarrow Y \rightarrow Z = (0.104 + 0.497) = 0.601$$

5. The influence of the road maintenance variable (X_4) on the regional economy (Z) through the mobility of goods transportation (Y)

$$X_4 \rightarrow Y \rightarrow Z = (0.199 + 0.497) = 0.696$$

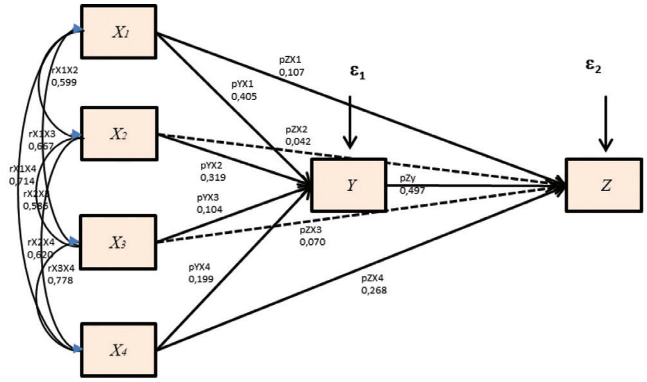

Figure 2: Path Analysis Diagram for Model II

4.3. Path Diagram Model II

The Path Diagram Model is in Figure 2:

1. The structural equation Model I

$$Y = 0.405X_1 + 0.319X_2 + 0.104X_3 + 0.199X_4 + \varepsilon_1$$

2. The structural equation Model II

$$Z = 0.107X_1 + 0.042X_2 + 0.070X_3 + 0.268X_4 + 0.497Y + \varepsilon_2$$

5. Discussion

This study proves that road infrastructure consisting of dimensions of accessibility, road design, road construction quality, and road maintenance simultaneously and partially has a positive and significant effect on the mobility of goods transport in Langkat Regency. Good road accessibility can connect the location of the generation (origin) and attraction (destination) of the transportation of goods within the district to ensure that goods produced by regional commodities can be transported from the production location to the destination location of transport and the distribution of goods needed by the community. Motorized goods transport vehicles have a specificity compared to other types of vehicles operating on the roads in terms of size and carrying capacity (Marhayanie, 2018). The road that is traversed by motorized goods transporting goods must have a design that is able to provide sufficient space for vehicle movement on the road and maneuver space at corners. A good road design has a sloping road (incline and descent) that is safe and comfortable for motorized goods to pass through, a wide and safe traffic lane for the movement of motorized goods for transportation of goods, there is a shoulder that supports the maintenance of the quality of road construction and can be used as a resting location and stop in an emergency. The quality of road construction affects driving comfort and the carrying capacity of motorized goods transporting vehicles.

The road construction must be able to withstand the axle pressure of motorized goods transporting the road surface and the road surface layer must be resistant to repetitive loads so that there is no fatigue of the pavement layer in the form of grooves and cracks. The better the quality of road construction, the higher the carrying capacity that can be loaded in the cargo space of goods transportation vehicles. Roads that have been built must have their service life maintained according to the calculated planning age. Road maintenance is an activity of road handling, in the form of prevention, maintenance and repairs needed to maintain road conditions in order to continue functioning optimally to serve traffic so that the defined plan life can be achieved. Road transportation infrastructure that supports the mobility of freight transport can reduce travel distances, travel time and minimize freight transportation costs.

This study found that partially the road transportation infrastructure in the form of road accessibility and maintenance dimensions has a positive and significant direct effect on the economy of the Langkat Regency area. This result is significant, seen from the community's interest in providing accessibility and maintenance of roads to make it easier for the community to reach the location of service facilities and the location of community economic activities such as: traditional markets, building material shops, agricultural equipment shops, gardening and fisheries to fulfill their daily needs. This research proves that partially the mobility of goods transport together with road transportation infrastructure has a positive and significant effect on the regional economy, which means that regional economic growth must be supported by road transportation infrastructure and high levels of freight mobility. Regional economic growth will benefit the Government through additional taxes and society through increased income. The joint role of road transportation infrastructure and mobility of goods transportation in regional economic growth can attract investors to develop their businesses in the Langkat Regency area so that regional commodities can be processed into semi-finished or finished materials to increase the value of goods and multiplayer effects such as: availability of fields work, the growth of new economic centers and the ease with which people can get life necessities at low and stable prices.

The results of this study, which prove that road transportation infrastructure has a positive and significant effect on the mobility of goods transport and the regional economy, is in line with the theoretical statement (Schumer, 1986) that the availability of sufficient transportation services (with a capacity) provides economic benefits, for example: (a) will expand the market with the availability of extensive transportation network so that the delivery of goods to various markets, which are far away, can be carried out smoothly; (b) can stabilize the price of goods, with the availability of smooth transportation facilities, so the goods needed in one area can be imported from other regions where the goods are in excess, so that the price level in the two regions becomes balanced or the price becomes stable; and (c) the availability of smooth transportation services will encourage regions to specialize in production according to their potential resources and theoretical statements Susantono (2013) that to increase the economic level of a region can be done by boosting the economic growth of a region and increasing the efficiency of logistics flows within an area. Poverty alleviation can be obtained through increasing people's income from increasing the use value of regional commodities and the availability of jobs and decreasing the cost of living due to the ease of obtaining goods at cheap and stable prices. The results of this study, which found that road transportation infrastructure with the dimensions of road accessibility and maintenance, have a direct positive and significant effect on the regional economy and is in line with research (Aschauer, 1989) which states that there is a correlation between transportation infrastructure and regional economic growth and research (Maimunah, 2010), which concludes that road infrastructure provides positive and significant impact on regional economies.

6. Conclusions and Suggestions

6.1. Conclusions

Based on the results of data analysis and discussion, the conclusions of this study are as follows:

1. It proves that road transportation infrastructure with the dimensions of accessibility, road design, road construction quality, and road maintenance simultaneously and partially has a significant and positive effect on the mobility of freight transport. The effect of road transportation infrastructure on the mobility of goods transport is 79.2%.
2. It proves that road transportation infrastructure and freight mobility simultaneously have a significant and positive effect on the regional economy by 80.9%.
3. Finds that road transportation infrastructure with the dimensions of road accessibility and maintenance partially directly has a significant and positive effect on the regional economy with path coefficient values of 0.107 and 0.268.
4. Finds that road transportation infrastructure with road design dimensions and road construction quality partially does not have a direct effect on the regional economy but has a positive and significant effect through the mobility of freight transport with path coefficient values of 0.159 and 0.052.
5. The variable of freight transport mobility becomes an intervening variable that acts to mediate or determine the relationship between road transportation infrastructure variables to the regional economy.

6.2. Suggestions

1. The construction and maintenance of road transportation infrastructure must be carried out in a sustainable manner to increase the mobility of goods transport from the location of generation (origin) and attraction (destination) to the transportation of goods within the district to ensure that regional commodities can be transported from the production location to the destination transportation and distribution of goods needed by the community.
2. Increasing the role of road transportation infrastructure and mobility of goods transportation needs to be carried out jointly in order to increase regional economic growth.

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