



Carrying Capacity and Transportation Infrastructure Factors that Affect Regional Economic Development in the Lake Toba National Tourism Strategic Area, Indonesia

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Abstract. The development of transportation infrastructure is very important to support sustainable tourism development. This research aims to analyze the carrying capacity factors and existing transportation infrastructure of Medan-Berastagi-Merek. Carrying capacity analysis was carried out using a quantitative descriptive approach. In general, the carrying capacity of the existing Medan-Berastagi-Merek Road Section as transportation access is obtained. Most indicators of quality, mobility, connectivity, accessibility, and timeliness were rated as good. The variables of obstacles and timeliness have a significant influence on regional economic development and deserve serious attention in developing national tourism strategic areas.

Keywords: Lake Toba, National Tourism Strategic Area, regional economic development, Super Priority Tourism Destination, transportation carrying capacity.

1 Introduction

Since the establishment of the Lake Toba KSPN level to become a Lake Toba Super Priority Tourism Destination (DPSP) along with four (4) other DPSPs, tourism development in Indonesia is expected to focus more on improving and creating a sustainable tourism ecosystem [1]. The complexity of problems and challenges in realizing Lake Toba as a priority destination face problems in various dimensions ranging from socio-economic, ecological, environmental, infrastructure, land, and institutional perspectives that are counterproductive [2].

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Infrastructure development to support sustainable tourism development needs to be supported because tourist destinations must have attractions that make tourists want to visit, stay for a long time, and spend money so that there is an acceleration of the local economy [3]. The accessibility of an area can be seen from the connectivity of road networks that connect with other regions because of the availability of various socio-economic activity facilities that encourage regional development so that public facilities appear as a result of regional development [4]. The higher the accessibility value of the region to other regions, the higher the potential for regional development [5].

The tourism industry is developed through a territorial approach, namely the division of tourism areas that have potential both which are immovable attractions such as natural beauty, monuments, and natural phenomena as well as moving attractions where the human factor plays an important role such as art, customs, ceremonies, celebrations, and fairs [6]. Tourism development must certainly be balanced with the preparation of infrastructure to support tourism activities [7]. This good infrastructure condition can facilitate the development of traffic due to heavy tourist visitors [8].

Based on the management problems of transportation implementation and the importance of supporting connectivity between regions in the tourism area, one alternative is the development of a new road section connecting Medan-Berastagi as an alternative road so that future projections are expected to increase accessibility and mobility [9]. Therefore, it is necessary to research the carrying capacity of the Medan-Berastagi-Merek Road infrastructure as transportation access in supporting tourism development in the Lake Toba National Tourism Strategic Area. This study aims to analyze the carrying capacity of the Medan-Berastagi-Merek Existing Road Section as transportation access in supporting economic and tourism activities in the Lake Toba National Tourism Strategic Area from the perspective of the user community and knowing the influence of infrastructure on tourism-based regional development.

2 Method

2.1 Data Collecting

This research was conducted in Karo Regency, especially the tourist destination area (DTW) traversed by the existing Medan-Berastagi- Lake Toba Road. This research uses a type of descriptive research with a quantitative approach. The approach taken in this study is a quantitative approach through measurements of variables using numbers [10]. In this study, data collection techniques are divided into two ways, namely primary data collection, namely data obtained through research activities directly to the research location to find complete data related to the problem under study and carried out through questionnaires, interviews, and observations. While secondary data collection is carried out by literature studies related to research [11]. Variables are the object of research, or what is the point of attention of a study. A variable is any circumstance, factor, condition, treatment, or action that can affect the outcome of an experiment [12]. In this study the variables used in this study consist of:

- a. Independent/exogenous variable, namely Regional Economic Development

- b. The dependent/endogenous variable is Road Infrastructure which consists of aspects of road quality, mobility, connectivity, accessibility, punctuality, obstacles, and security/safety.

In this study, data collection in questionnaires used a Likert scale (see Table 1). The Likert scale is a type of scale used in research and measurement to measure a person's level of opinion, attitude, or perception towards a particular topic or statement [13]. The Likert scale consists of a series of statements or questions related to a particular topic [14]. Respondents were asked to rate these statements by responding in the form of a degree of agreement or disagreement or some cases, a level of importance or satisfaction [15].

Table 1. Data Categorization at the Likert Scale

Score	Scale Category
1	Very Good/High
2	Good/High
3	Not Good/Poor
4	Bad/Low
5	Very Bad/Low

2.2 Data Analysis

Factors Influencing Tourism-Based Regional Development. Regression analysis is a statistical technique to measure the estimated relationship between variables [16]. The linear regression model aims to explain the spatial distribution of dependent variables through a combination of independent variables [17]. Based on the results of predetermined calculations, there are 6 variables to be analyzed. Multiple linear regression models are used as follows [18,19]:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7 + e \quad (1)$$

Information:

Y	= Regional Economic Development
B_0	= intercept or constant
$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7$	= Regression coefficient X_1 = Road quality
X_2	= Connectivity
X_3	= Mobility
X_4	= Resistance
X_5	= Security/Safety
X_6	= Accessibility
X_7	= Punctuality
e	= Standard error

Classical Assumption Test: A good regression model must satisfy classical assumptions. The purpose of fulfilling this classical assumption is that when working

on the regression model there are no problems related to statistics. To test whether the instrument used is measurable and accurate, an assumption test is used against the data with the SPSS program as follows:

1. Normality test, one method of testing data normality is to use the Kolmogorov-Smirnov theory or formula [20]. The basis for decision-making in the Kolmogorov-Smirnov normality test is that if a significance value is greater than 0.05 then the data can be said to be normally distributed and vice versa [21].
2. Multicollinearity test, used to determine the presence or absence of correlation between independent variables in regression models [22]. Detecting multicollinearity can see the tolerance value and inflation factor (VIF) variants as a benchmark. If the tolerance value ≤ 0.10 and the VIF value ≥ 10 , it can be concluded that in the study there is multicollinearity [23].
3. The heteroscedasticity test is used to test whether in a regression there is an inequality of variance from residual from one observation to another observation [24]. A prerequisite that must be met in the regression model is the absence of symptoms of heteroscedasticity. The results of the glacier test show that there is no heteroscedasticity if the probability value of significance is above the confidence level of 0.05 [25].

Hypothesis Testing

A hypothesis is an assumption or statement that may be true or false about a population. Hypothesis testing in this study is carried out to determine whether the hypothesis can be accepted or rejected in this study:

1. The coefficient of determination (R^2) is a measure of the suitability of the regression line to the data used to see the magnitude of the influence of the independent variable on the dependent variable and expressed in percentage form. If the value of the Coefficient of Determination is between 0 and 1 ($0 \leq CD \leq 1$) then the magnitude of the influence of the independent variable on the variation (rise or fall) of the dependent variable is by the value of the Coefficient of determination itself, and the rest comes from other factors [26].
2. The simultaneous test (F-Test) can be determined from the magnitude of the level of significance (α) value of 0.05. Decision-making is done by looking at the significance value, namely if the value of F-count $<$ F-table, then hypothesis H_1 is rejected and H_0 is accepted, and vice versa if the value of F-count $>$ F-table, then the hypothesis H_1 is accepted and H_0 is rejected. The simultaneous significant test (F-Test) is used to test whether or not the effect of the independent variable simultaneously on the dependent variable is significant.
3. Partial test (T-Test) is used to determine the effect of each independent variable on the dependent variable [27]. The t-test can be determined from the magnitude of the level of significance (α) value, which is 0.05. Decision-making is done by looking at the significance value, namely if the significance value is greater than 0.05, then H_0 is accepted and H_1 is rejected, and vice versa if the significance value is smaller than 0.05 then H_0 is rejected and H_1 is accepted [28].

3 Findings and Discussion

3.1 Medan-Berastagi-Merek Road Infrastructure in the Perspective of Tourism Business Actors

This study uses several indicators to measure the Medan-Berastagi-Merek Road infrastructure as an infrastructure supporting the development of Lake Toba's national super-priority destination. These indicators are quality, mobility, connectivity, barriers, security/safety, accessibility and punctuality (see Table 2).

Table 2. Results of Assessment of Medan-Berastagi-Merek Road Infrastructure as Access to Lake Toba Tourism Area

Dimension	Indicator	Mean	Score	Mean per Dimension	Score of Dimension	Category of Valuation
Quality	Road to the location	3.395	679	3.520	704	Good
	Road inside object	3.510	702			
	Road quality improvement	3.655	731			
Mobility	From his hometown to the region	3.555	711	3.580	716	Good
	From his hometown to the location of the object	3.590	718			
	From one object to another in the region	3.595	719			
Connectivity	Between provincial capitals and locations	3.365	673	3.572	714	Good
	Between the district capital and location	3.705	741			
	Between locations within the region	3.645	729			
Obstacles	Intensity of Obstacles	3.180	636	3.373	675	Not Good
	Duration of Obstacles	3.720	744			
	Frequency of obstacles at intersections	3.220	644			

Security/ Safety	Level of concern about security	3.690	738	3.353	671	Not Good
	Potential harm from natural factors	3.055	611			
	Potential harm from the human factor	3.315	663			
Accessibility	From the visitor's hometown	3.695	739	3.640	728	Good
	Between objects within the area	3.670	734			
	Between placed in an object	3.555	711			
	Time match with estimation	3.620	724			
Punctuality	Intensity of punctuality disturbance	3.860	772	3.738	748	Good
	Cost match with outcome/benefit	3.735	747			
Average			708	3.540	708	Good

Road Quality: The quality dimension shows the difference in mean values, with the highest value reaching 3.655 on the road quality improvement indicator, while the lowest value of 3.395 is related to the road indicator within the object. The average per dimension is 3.520. The results of this data reveal that the quality of roads to and within these areas can be categorized as "good," but there is still potential to improve road quality. These findings could be a significant opportunity in the context of developing better infrastructure to support the development of natural tourism.

In the development of road quality, it is necessary to pay attention to many things. Reference [29] explained that one of the strength or sturdiness of a construction is determined by the quality of the basic materials used. As a land transportation infrastructure, pavement must have a surface that is always flat and rough, so that road users can feel comfortable and safe [30]. Because this pavement is built on basic soil, the quality of the base soil will have a major impact on pavement performance [31]. With the demand for pavement that must always have a flat surface, the main requirement that must be met by basic soil is that it is not easy to change shape. Basic soil that changes shape, both due to traffic loads and weather, will cause pavement to experience damage such as wavy, grooves and subsidence [32].

Mobility: In the mobility aspect, there are variations in the mean value, with the highest value reaching 3.595 on the indicator that measures the movement from one object to another within the region. On the other hand, the lowest mean value of 3.555 is related to mobility indicators from the visitor's hometown to the region. The average per dimension is 3.580. These results indicate that the mobility of visitors from the city of origin to the region and between objects within this area can be considered "good", indicating sufficient access availability. However, it is important to note that connectivity between objects in the area is also an important factor that must be maintained so that visitors can smoothly move from one object to another.

Connectivity: In the connectivity dimension, variations were found in the mean value, with the highest value reaching 3.705 on the indicator that measures connectivity between the district capital and location, while the lowest mean value of 3.365 was related to the connectivity indicator between locations within the region. The average per dimension is 3.572. These results indicate that connectivity between provincial capitals and specific locations can be considered "good." However, it should be emphasized that improvements in connectivity between the district capital and the location and between locations within the region need further attention to optimize the potential of existing natural tourism.

Reference [33] emphasize the importance of connectivity in creating a seamless experience for visitors in wider natural tourism destinations. Therefore, destination managers need to maintain and improve connectivity between objects within the area to ensure visitors can easily move from one place to another, increase their comfort during the visit, and maximize the natural tourism potential of the region.

Obstacles: In the context of the constraint dimension, there is a significant variation in the mean value. The highest value, of 3.720, is related to the obstacle duration indicator, while the lowest mean value, reaching only 3.180, is found in the Resistance intensity indicator. The average per dimension is 3.373. The results of this data show that both the intensity and duration of the obstacle fall into the "not good" category. These findings signal that corrective action is needed to reduce the barriers visitors face and improve their experience while visiting.

Reference [34], explained that side obstacles are roadside activities that often cause significant effects. High roadside activity has a major effect on road capacity and performance in an urban area. Among them are pedestrians, road crossers, street vendors (street vendors), slow-moving vehicles (pedicabs, bicycles, horse-drawn carriages), vehicles stopping carelessly (city transportation, buses in the city), parking on the shoulder of the road (on-street parking), and vehicles in and out of roadside land use activities. One of the causes of high roadside activity is caused by the development of population activities that grow and develop every year in urban areas. The development of population activities has a major influence on facilities and meeting needs, but this has not been balanced by the provision of adequate transportation facilities and infrastructure, so transportation problems arise on urban roads.

Security/Safety: In the context of the security/safety dimension, there is significant variation in the mean value. The highest value, of 3.690, is related to the level of concern about the safety indicator, while the lowest mean value, reaching only 3.055, is found in the indicator Potential hazards from natural factors. The average per dimension is 3.353. The results of this data indicate that attention to the security and safety aspects of visitors can be considered good. However, it is necessary to conduct a more in-depth examination regarding potential hazards that may come from natural and human factors to ensure the overall safety of visitors.

The results of this study reflect significant variations in mean values that describe visitors' perceptions of security and safety aspects when visiting certain natural tourist destinations. The highest score, which reached 3,690, was related to the level of safety concern indicator, indicating that visitors generally feel relatively safe while at the location. These results are in line with theories that underscore the importance of safety perceptions in visitor decision-making regarding tourist destinations [35]. It should be noted that the lowest mean value, reaching only 3.055, is found in the indicator of Potential danger from natural factors. This highlights the need for more serious attention to natural factors such as extreme weather, natural disasters, or other natural conditions that may affect the safety of visitors. Theories focusing on risk management in nature tourism emphasize the importance of identifying and mitigating potential natural hazards [36].

Accessibility: In the Accessibility dimension, variations are found in the mean value. The highest value, reaching 3.695, is related to the indicator From the visitor's hometown, while the lowest mean value is 3.555, which relates to the indicator between places in an object. The average per dimension is 3.640. These findings illustrate that accessibility from visitors' hometowns and between objects within the area can be considered as "good." This can be one of the strength points that need to be promoted in marketing efforts for natural tourist destinations.

Road infrastructure development, both adding routes, widening roads, and improving road sections in Medan-Berastagi-Merek, greatly affects the use of city land for settlement, trade, or services. As well as research conducted by reference [37] in major cities in the United States that increased road capacity can increase market penetration. For this reason, in planning infrastructure development, an instrument in the form of policies is needed that can anticipate the negative effects of development itself. This research was conducted to create a model where the output can be used by decision-makers to monitor and control land use change in an urban environment, due to the rapid development of road infrastructure.

Punctuality: In the punctuality dimension, there is variation in the mean value. The highest value, which is 3.860, is related to the intensity of the punctuality disorder, while the lowest mean value is 3.620, which is related to Compatibility with the outcome/benefit. The average per dimension is 3.738. It was found that punctuality impairment can be considered as "good," which is a positive thing. Even so, maintaining consistency of punctuality is still important to provide a satisfying experience for visitors. In Variable Y, the lowest mean value is 3.353 (i.e. dimension Y5) while the highest mean value is 3.738 (i.e. dimension Y7), with its mean per variable being 3.540. Research conducted by reference [38] in Lampung explains that poor accessibility can reduce tourist interest in visiting tourist areas.

Based on Table 2, it can be seen that although in general, the assessment results reach the good category (score 3.54 on a scale of 5), two indicators fall into the poor category, namely obstacles (score 3.37 out of 5) and security/safety (score 3.36 out of 5). Other indicators namely quality, mobility, connectivity, accessibility, and punctuality have been rated good. This condition is not yet an ideal condition for supporting the development of the tourism sector which has become a mainstay sector in the Lake Toba area and its surroundings [39]. This is because the tourism sector is a spoiled and sensitive sector that requires the best quality of infrastructure services.

Reference [40] state that highways are land transportation infrastructure to serve the movement of people and/or goods from one place to another safely, comfortably, and economically. The purpose of building roads is to increase the accessibility and mobility of socio-economic activities in the community. Roads are one part of public services that are inseparable from the state's obligation to improve the welfare of its people and it is the duty of local governments to formulate public policies by public will to provide quality public services [41].

Road infrastructure is a tool to drive economic development not only in urban areas but also in rural areas or tourist attraction areas. Through projects, the infrastructure sector can create jobs that absorb a lot of labor. In addition, infrastructure is a pillar determining the smooth flow of goods, services, people, money, and information from one market zone to another. This condition will allow the price of goods and services to be cheaper so that they can be purchased by most Indonesians whose income is still low. So, the circulation of goods, services, people, money, and information also determines price movements in the market, in other words, road infrastructure neutralizes the prices of goods and services between regions, especially towards tourist areas.

Road performance is the ability of road sections to accommodate or serve the number of vehicles passing through the road in a certain period where road performance is determined by several indicators, namely capacity, saturation degree, speed, density, and travel time [42]. Furthermore, it is explained that if there is no good handling of road performance, road sections have the potential to experience congestion, queues, and delays, as well as traffic accidents that can interfere with the smoothness and comfort when driving on the road. Therefore, the need for handling in the form of planned traffic management is based on the road performance indicators mentioned.

Related research that has been conducted previously by reference [43] is on Jalan Imam Bonjol Denpasar which is included in the Denpasar-Tuban national road section

Research was conducted to analyze the performance of Imam Bonjol Denpasar Road in supporting the tourism sector in Denpasar City. The results of the analysis showed that the performance of Imam Bonjol Road in existing conditions (in 2019) reached a saturation degree of 1.61-2.14, with a service level of F in each segment. If the widening plan is carried out, in 2019 the degree of saturation will be 0.41-1.00, with the level of road service varying between B to E. Another study by reference [44] found that the speed of vehicles on the Palima-Baros road section when the density is empty is 54 km/hour and has a road capacity value of 2,623 junior high school/hour. The highest average traffic volume on weekdays, namely the direction to Serang City of 1,657.33 passenger car units (pcu) / hour, and the highest average traffic on weekends, namely the direction to Serang City of 1,430.43 pcu/hour, with the travel time was 0.0117 hours.

3.2 The Influence of Infrastructure on Tourism-Based Regional Development

To ensure the reliability of the results of this study, a classical assumption test has been carried out on the data that has been collected. The results of the classical assumption test show that all data used in this study meet the requirements of the classical assumption test [21]. This indicates that the data meet the requirements such as the normality test, multicollinearity test, and heteroskedasticity test are important prerequisites in statistical analysis. Thus, the validity and statistical validity of the findings in this study are reliable, and the results can be used as a solid foundation for making further conclusions and recommendations so that hypothesis testing can be carried out.

Simultaneous test (F-test): The simultaneous test (statistical F-test) aims to show whether all independent variables (independent variables) included in the model have an influence together on the dependent variable (dependent variable) with an error degree of 5% ($\alpha = 0.05$). The results of simultaneous tests can be seen in the following Table 3.

Table 3. Simultaneous test results (F-test)

		ANOVA ^a				
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	496.519	7	70.931	3.088	.004 ^b
	Residual	4409.676	192	22.967		
	Total	4906.195	199			
2	Regression	495.855	6	82.643	3.617	.002 ^c
	Residual	4410.340	193	22.852		
	Total	4906.195	199			
3	Regression	494.797	5	98.959	4.352	.001 ^d
	Residual	4411.398	194	22.739		
	Total	4906.195	199			
4	Regression	493.663	4	123.416	5.454	.000 ^e
	Residual	4412.532	195	22.628		
	Total	4906.195	199			
5	Regression	487.833	3	162.611	7.213	.000 ^f
	Residual	4418.362	196	22.543		
	Total	4906.195	199			
6	Regression	452.670	2	226.335	10.012	.000 ^g
	Residual	4453.525	197	22.607		
	Total	4906.195	199			

a. Dependent variable: regional economic development

b. Predictors: (constant), punctuality, barriers, quality, security/safety, accessibility, connectivity, mobility

c. Predictors: (constant), punctuality, barriers, quality, security/safety, connectivity, mobility

d. Predictors: (constant), punctuality, barriers, quality, security/safety, connectivity

e. Predictors: (constant), punctuality, barriers, quality, security/safety

f. Predictors: (constant), punctuality, obstacles, security/safety

g. Predictors: (constant), punctuality, obstacles

From the results obtained with the help of SPSS software with the backward method, the significance value for the simultaneous influence of the independent variable on Y is $0.00 < 0.05$ so it can be concluded that quality, mobility, connectivity, obstacles, security/safety, accessibility, and punctuality. This analysis is continued with the T-test to be able to find out the independent variable that has a real influence on the dependent variable.

Partial test (T-test): Partial tests in multiple regression are used to determine whether the regression model of the independent variable partially has a significant effect on the dependent variable. Decision-making criteria H_0 is accepted when Significance > 0.05

(no effect) and H_0 is rejected when Significance < 0.05 (effect). The results of the T-test can be seen in Table 4.

Table 4. Partial test result (T-test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant)	27.542	2.260		12.186	.000
	Quality	-.038	.077	-.051	-.498	.619
	Mobility	-.022	.095	-.028	-.235	.815
	Connectivity	.021	.090	.026	.229	.819
	Obstacles	.080	.053	.142	1.510	.133
	Security/Safety	.078	.067	.127	1.162	.247
	Accessibility	.013	.075	.018	.170	.865
	Punctuality	.094	.079	.128	1.183	.238
2	(Constant)	27.588	2.238		12.325	.000
	Quality	-.036	.076	-.049	-.479	.633
	Mobility	-.020	.094	-.025	-.215	.830
	Connectivity	.023	.089	.030	.263	.793
	Obstacles	.080	.053	.142	1.521	.130
	Security/Safety	.080	.065	.131	1.227	.221
	Punctuality	.096	.078	.132	1.235	.218
3	(Constant)	27.457	2.149		12.779	.000
	Quality	-.040	.073	-.054	-.547	.585
	Connectivity	.019	.086	.024	.223	.824
	Obstacles	.079	.052	.140	1.511	.133
	Security/Safety	.076	.062	.123	1.227	.221
	Punctuality	.093	.076	.127	1.219	.224
4	(Constant)	27.606	2.037		13.555	.000
	Quality	-.036	.070	-.048	-.508	.612
	Obstacles	.082	.051	.145	1.615	.108
	Security/Safety	.079	.060	.129	1.321	.188
	Punctuality	.098	.073	.134	1.348	.179
5	(Constant)	27.258	1.914		14.241	.000
	Obstacles	.076	.049	.135	1.543	.124
	Security/Safety	.073	.059	.119	1.249	.213
	Punctuality	.084	.067	.115	1.251	.212
6	(Constant)	27.450	1.911		14.368	.000
	Obstacles	.099	.046	.176	2.175	.031
	Punctuality	.123	.059	.169	2.081	.039

a. Dependent Variable: Regional Economics Developm

From Table 4, it can be seen that the best regression model equation is as follows: $Y_2 = 24.450 - 0.031 (X_4) + 0.039 (X_7)$. The obstacle variable has a significance value of 0.031 so it can be concluded that obstacles influence the development of tourism-based areas. Many obstacle factors affect tourism activities such as traffic barriers and security barriers.

On the way to tourist attractions, traffic obstacles are often encountered around the road which may cause conflict situations affect traffic flow and reduce road efficiency. When pedestrians cross or walk along the road, this can make traffic have to stop for a while to give way to pedestrians. This results in wasted time stopping and waiting, which in turn reduces road capacity due to increased travel time on a particular road segment. Therefore, it is necessary to regulate activities on the side of the road so as not to interfere with the smooth flow of traffic [34]. In addition to traffic barriers, security barriers also affect the development of tourism-based areas. The number of illegal levy activities carried out by unscrupulous people to visitors along the journey of the tourist attraction also affects the level of tourist attraction to come back to the attraction [45].

Based on Table 5, the significance of the punctuality variable of 0.039 can be concluded that punctuality influences the development of tourism-based areas. This is because the punctuality value is by the requirement that if the significance value is smaller than 0.05 then the variable has an influence (H1 is accepted). Planned trips often involve several interconnected places and strictly scheduled activities commonly provided by travel providers [46]. In tourism destinations such as Lake Toba, the time factor is a key factor that affects the experience of tourists. The role of modes of transportation such as ships used to cross becomes important, and the availability of this transportation is not always available all the time. Therefore, careful planning and effective time management are essential in ensuring the visit goes smoothly and is not interrupted by transportation delays. It is expected that visitors will be able to maximize visits to other attractions that have been scheduled [1]. This refers to the importance of good coordination and planning in the tourism industry to ensure a positive experience for tourists.

4 Conclusion & Recommendations

The carrying capacity of the existing Medan-Berastagi-Merek Road section as transportation access in supporting economic and tourism activities in the Lake Toba National Tourism Strategic Area from the perspective of the user community is generally included in the "good" assessment category (overall average score of 708). For each aspect, some indicators, namely quality, mobility, connectivity, accessibility, and punctuality have been rated "good", but there are two indicators that fall into the "bad" category, namely obstacles (score 675) and security/safety (score 671). Simultaneously, road quality, mobility, connectivity, accessibility, punctuality, obstacles, and security/safety have a significant effect on the economic development of the region. However, through the selection of the best model using the backward method, infrastructure development variables that have a significant effect on the

development of tourism-based economic areas in the strategic area of Lake Toba national tourism are "obstacles" and "punctuality". Therefore, the development of transportation infrastructure in this section must focus on efforts to minimize obstacles and remember punctuality for tourism sector-based economic actors in the region.

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