Analysis of determination Transit Oriented Development areas (TOD) at Light Rail Transit (LRT) stations in Palembang City Review on environmental aspects

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ABSTRACT

The concept of Transit Oriented Development (TOD) at the Light Rail Transit (LRT) station in Palembang City in terms of Environmental Aspects. This study discussed the city of Palembang which already has several transit-based transportation such as Bus Rapid Transit (BRT) and Light Rail Transit (LRT) as a solution to overcome existing congestion. The several areas that still have congestion points and have not been able to be minimized, namely; (1) Bumi Sriwijaya, (2) Cinde Market, (3) 16 Ilir Market, and (4) Jakabaring. At this location, there were several problem phenomena that are still faced in the implementation of the existing TOD where the community does not use an integrated transportation system, This research used Process Hierarchy Analysis (AHP) method. This research was the preparation of evaluation and analysis of the determination of the Transit Oriented Development (TOD) area in the city of Palembang in terms of environmental aspects based on the AHP decision-making method. The research locations reviewed in this study are densely populated areas. In this study using a quantitative research approach. A quantitative approach used to analyze the determination of the Transit Oriented Development (TOD) area in Palembang City in terms of environmental aspects using AHP decision-making analysis techniques in compiling research discussions. The potential as location of the Transit Oriented Development (TOD) area in Palembang City was the Pasar 16 Ilir area (location 3). This area had the highest potential from other areas after the AHP data processing was carried out against the three main criteria for determining the TOD area.

Keywords: transit oriented development (TOD); hierarchical method analysis (AHP); environmental aspects; light rail transit (LRT).

INTRODUCTION

National development that puts forward the principles of sustainable development is currently being developed in Indonesia. Sustainable development for an area is very important, this is not only about development in favor of environmental preservation, but also development that integrates reducing impacts on environmental aspects (Luck, 2001). The growth of urban areas which are increasingly directed to become the center of very fast economic growth in Indonesia has demanded a rapid population mobility system, dependence on cars with threats to air damage and climate change that leads to disaster risk (United Nations, 2015).

In Indonesia, the growth of urban areas into the center of the economy and trade is also unavoidable. Almost all big cities in Indonesia are used as centers of economy and trade, so that urbanization is unavoidable, overcrowding is uncontrollable and increasingly threatens the economic, social and environmental impacts. For example, the city of Palembang, which is the capital city of the province of South Sumatra which has continued to grow in recent years. The city that grew into a metropolitan city has a population density of 2 million people in 2020. The consequences of the continuous migration of residents outside the city of Palembang to work, do business and live in the city of Palembang have now presented various urban problems such as congestion, floods and settlements.

Palembang city is one of the most populous cities on the island of Sumatra. Along with the increase in the human population in the city of Palembang, there will be more transportation needed, causing an increasing need for transportation facilities and infrastructure that support human activities in the fields of Economics, Education, Social, Culture and other fields. Therefore, it affects the level of

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development of urban activities in the city of Palembang which causes traffic conditions to worsen, mainly due to the increase in traffic volume. This requires the need for an integrated urban planning development pattern from one aspect to another.

Currently, the city of Palembang itself already has several transit-based transportation such as Bus Rapid Transit (BRT) and Light Rail Transit (LRT) as a solution to overcome existing congestion. However, in its implementation, until now it has not been able to function optimally in reducing the use of private vehicles.

There are several areas that still have congestion points and have not been able to be minimized. In this study, for example, taking samples of locations (1) Bumi Sriwijaya, (2) Cinde Market, (3) 16 Ilir Market, and (4) Jakabaring, at these locations there are several problem phenomena that are still faced in the implementation of the existing TOD where the lack of utilization transportation system that is integrated by the community, then buildings that have not been integrated or still require distance and time to move. In the Pasar Cinde area, for example, in their daily life, people in the Pasar Cinde area still often rely on the use of private cars, taxis, either regular taxis or online taxis, basic motorcycle taxis or online motorcycle taxis compared to mass transportation (Widiyanti, 2019). The long distance of the pedestrian bridge to the LRT is one of the reasons people complain. These things show that the current TOD is still not integrated in the city of Palembang with the existing conditions.

Figure 1. Maps of Palembang City

Related to the existing conditions, as the researcher knows, there have been several previous researchers who researched the application of TOD in Palembang City with several concepts each that have been applied which are more likely to use existing transportation facilities as the object of previous research. On this occasion the researcher will apply the concept of Transit Oriented Development (TOD) in Palembang City in terms of Environmental Aspects in detail as a complement to the treasures of consideration for the development planning of the Palembang City area.

The city of Palembang has become a city that has developed quite rapidly in recent years, this is projected to cause transportation problems in the form of congestion in the city of Palembang. With the Bus Rapid Transit (BRT) and Light Rapid Transit (LRT) it has not been able to maximize the use of public transportation in the city of Palembang because the level of congestion on main roads is increasing. There are needs to be an evaluation of the determination of the current TOD concept so that it can formulate recommendations for transit areas that can maximize the role of BRT and LRT.

Transit Oriented Development first appeared in the 1990s which was pioneered by Peter Calthorpe. TOD arises due to the urban sprawl phenomenon which results in the high use of private vehicles and causes congestion (Yuniasih, 2007). According to Taolin (2008), the transit-based regional

development movement is based on the deteriorating quality of city life marked by congestion, sprawl, and unintegrated land use. TOD has the goal of creating a destination that is comfortable, safe, fun and adequate for pedestrians (walkable environment). By mixing various functions, travel activities that need to be carried out can be combined into a shorter and faster way. These functions are the center of the commercial area, offices, retail, service,

RESEARCH METHODS

In this study used a quantitative research approach. A quantitative approach was used to analyze the determination of the Transit Oriented Development (TOD) area in Palembang City in terms of environmental aspects using AHP decision-making analysis techniques in compiling research discussions.

In this study, there were several analytical techniques used and have a relationship between one another. The selection of analytical techniques in this study was based on the formulation of the problem and the results of the literature review. The analytical technique used in this study was descriptive analysis to evaluate the application of the existing area in Palembang City at this time. The second analytical technique was the Analytical Hierarchy Process (AHP) to determine what factors to choose a location that can determine the Transit Oriented Development (TOD) area in terms of environmental aspects in the city of Palembang. The objects of the study in this target were the characteristics of the area which include indicators of mixed land use patterns, the density of land use in transit areas and pedestrian friendly areas in the Palembang City area.

RESULTS AND DISCUSSION

The development of the city of Palembang which is quite fast requires spatial planning. The purpose of urban spatial planning is a directive for the realization of urban space to be achieved in the future. The functions of this objective include, among others, as a basis for formulating spatial planning policies and strategies, providing direction for the preparation of main program indications, and as a basis for directing the determination of provisions for controlling the use of urban space.

In determining the Transit Oriented Development (TOD) area, there are 8 variables that will greatly determine the determination of the TOD area. Prior to the test to answer the hypothesis, a normality test was carried out on each variable, with the following results:

Table 1. Normality Test

Variable	Sig Value	Sig limit	Information
Density (Density)	0.48	0.05	Normal
Mixed Land Use (Diversity)	0.83	0.05	Normal
Supporting Facilities (Design)	0.33	0.05	Normal
High Density Area (High Density)	0.46	0.05	Normal
Pedestrian Friendly (Walkable)	0.13	0.05	Normal
Parking (Parking)	0.18	0.05	Normal
Pedestrians (Pedestrian)	0.11	0.05	Normal
Move (Transit)	0.11	0.05	Normal
Environment	0.21	0.05	Normal

Source: Research Results

Based on table 1 above, the results of the normality test using the Kolmogorov-Smirnov test on each variable with a value of sig> 0.05, meaning that the data distribution was normally distributed.

Linearity Test

Table 2. Linearity Test

Variable	Sig Value	Sig Batas limit	Information
Density (Density)	0.00	0.05	linear
Mixed Land Use (Diversity)	0.00	0.05	linear
Supporting Facilities (Design)	0.00	0.05	linear

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High Density Area (High Density)	0.00	0.05	linear
Pedestrian Friendly (Walkable)	0.00	0.05	linear
Parking	0.00	0.05	linear
Pedestrians	0.00	0.05	linear
Move (Transit)	0.00	0.05	linear

Source: Research Results

Based on table 2 above, the results of the linearity test are obtained on each variable with a value of sig <0.05, meaning that the data was linear.

Multicollinearity Test

Table 3. Multicollinearity Test

Variable	Tolerance	VIF	Information
Density (Density)	0.32	3.07	No symptoms
Mixed Land Use (Diversity)	0.65	1.53	No symptoms
Supporting Facilities (Design)	0.13	6.74	No symptoms
High Density Area (High Density)	0.36	2.81	No symptoms
Pedestrian Friendly (Walkable)	0.12	8.66	No symptoms
Parking	0.27	3.74	No symptoms
Pedestrians	0.21	4.78	No symptoms
Move (Transit)	0.19	5.26	No symptoms

Source: Research Results

Based on table 3 above, the results of the multicollinearity test are obtained each variable has a VIF value < 10, meaning that there was no multicollinearity symptom.

Heteroscedasticity Test

The heteroscedasticity test aimed to test whether in the regression model there is an inequality of variance from the residuals of one observation to another observation. If the variance of the residual from one observation to another observation remains, it is called homoscedasticity and if it is different it is called heteroscedasticity.

Table 4. Heteroscedasticity Test

Variable	Sig Value	Sig Batas limit	Information
Density (Density)	0.60	0.05	No symptoms
Mixed Land Use (Diversity)	0.05	0.05	No symptoms
Supporting Facilities (Design)	0.34	0.05	No symptoms
High Density Area (High Density)	0.08	0.05	No symptoms
Pedestrian Friendly (Walkable)	0.59	0.05	No symptoms
Parking	0.50	0.05	No symptoms
Pedestrians	0.75	0.05	No symptoms
Move (Transit)	0.32	0.05	No symptoms

Source: Research Results

Based on table 4 above, the results of the heteroscedasticity test are obtained on each variable with a sig value > 0.05, meaning that there were no symptoms of heteroscedasticity.

Autocorrelation Test

Table 5. Autocorrelation Test

Model Summary					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.58a	0.34	0.29	3.52	1.95

a. Predictors: (Constant), Transit, High Density, Pedestrians, Mixed Land Use (Diversity), Parking (Parking), Walkable, Density, Facilities Support (Design)
b. Dependent Variable: Environment

Source: Research Results

Based on the table above, the Durbin-Watson value is 1.95. Decision making on this assumption requires two auxiliary values obtained from the Durbin-Watson table, namely the values of dL and dU, with k=8 and n=113.

Based on the results of the analysis, it can be seen that the DW value of 1.95 is greater than the upper limit (dU) 1.85 while it is smaller than (4-dU) 2.15. Based on the results above, it can be seen that dU<DW<4-dU. So it can be said that there are no symptoms of autocorrelation.

Multiple Linear Regression Test

To see what factors influence choosing a location that can determine Transit Oriented Development (TOD) in terms of environmental aspects in Palembang City then used multiple linear regression analysis. Based on the results of data processing with the help of the IBM 25.0 program, a summary of the empirical research results can be seen as follows

Table 6. Regression Analysis Results

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	6.72	2.80		2.40	0.02
	Density (Density)	0.25	0.07	0.31	3.42	0.00
	Mixed Land Use (Diversity)	0.23	0.07	0.32	3.50	0.00
	Supporting Facilities (Design)	0.25	0.04	0.53	6.60	0.00
	High Density Area (High Density)	0.38	0.22	0.16	2.71	0.01
	Pedestrian Friendly (Walkable)	1.00	0.19	0.45	5.26	0.00
	Parking (Parking)	0.90	0.19	0.41	4.79	0.00
	Pedestrians (Pedestrian)	1.27	0.22	0.47	5.68	0.00
	Move (Transit)	0.78	0.20	0.33	3.72	0.00

a. Dependent Variable: Environment

Source: Research Results

From table 6 above, multiple regression equations can be made as follows:

Y = 6.72 + 0.25 X1 + 0.23 X2 + 0.25 X3 + 0.38 X4 + 1.00 X5 + 0.90 X6 + 1.27 X7 + 0.78 X8 + e
From these equations it can be concluded that:

1. From the multiple linear regression equation model above, it can be seen that the constant value is 6.72, which means that without the influence of the variable density (density), mixed land use (diversity), supporting facilities (design), high area density (high density). , friendly to pedestrians (walkable), parking (parking), pedestrians (pedestrian), and moving (transit), the environment has reached 6.72.
2. The density variable regression coefficient (density) is 0.25. This means that if the environmental value increases by one unit, the density will increase by 0.25 in each unit. Assuming other variables do not change or are constant.
3. The regression coefficient for the mixed land use variable (diversity) is 0.23. This means that if the environmental value increases by one unit then the mixed land use (diversity) will increase by 0.23 in each unit. Assuming other variables do not change or are constant.
4. The regression coefficient for the supporting facilities (design) variable is 0.25. This means that if the environmental value increases by one unit, the supporting facilities (design) will increase by 0.25 in each unit. Assuming other variables do not change or are constant.

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5. The regression coefficient for the high density variable is 0.38. This means that if the environmental value increases by one unit, the high density area will increase by 0.38 in each unit. Assuming other variables do not change or are constant.
6. The regression coefficient for the walkable variable is 1.00. This means that if the environmental value increases by one unit, then walkable will increase by 1.00 in each unit. Assuming other variables do not change or are constant.
7. The parking variable regression coefficient (parking) is 0.90. This means that if the environmental value increases by one unit, parking will increase by 0.90 in each unit. Assuming other variables do not change or are constant.
8. The pedestrian variable regression coefficient (pedestrian) is 1.27. This means that if the environmental value increases by one unit, pedestrians (pedestrians) will increase by 1.27 in each unit. Assuming other variables do not change or are constant.
9. The regression coefficient of the moving variable (transit) is 0.78. This means that if the environmental value increases by one unit, the transit will increase by 0.78 in each unit. Assuming other variables do not change or are constant.

In testing multiple linear regression is a regression model that involves more than one independent variable. Multiple linear regression analysis was carried out to find out the direction and how much influence the independent variables have on the dependent variable (Ghozali, 2018). The purpose of multiple linear regression analysis is to find out how much influence some of the independent variables have on the dependent variables and can also predict the value of the dependent variable if all the independent variables have known values. In multiple linear regression analysis with many independent variables, problems often arise because of the relationship between two or more independent variables. Independent variables that are correlated with each other are called multicollinearity.

Hypothesis test

Test of the Coefficient of Determination (R 2)

Coefficient n d determination is used to see how much influence the proportion of variations in changes in the independent variable (independent variable) as a whole has on the dependent variable (dependent variable) in table 7 as follows:

Table 7. R2 Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.58a	0.34	0.29	3.52

a. Predictors: (Constant), Transit, High Density, Pedestrians, Mixed Land Use (Diversity), Parking (Parking), Walkable, Density, Facilities Support (Design)

Source: Research Results

From the table above, R square 0.34 means 34.0% variabledensity, mixed land use (diversity), supporting facilities (design), high area density (high density), pedestrian-friendly (walkable), parking (parking), pedestrians (pedestrian), and moving (transit) affect environment and the remaining 66.0% is influenced by other variables outside the research variables.

t test

The t statistical test is basically used to see the effect of the independent variables on the dependent variable partially. Where in this study to see the effect of density (density), mixed land use (diversity), supporting facilities (design), high density (high density), pedestrian friendly, parking (parking), pedestrians (pedestrian) , and move (transit) with the environment .

Table 8. T test results

Coefficient				
Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	6.72	2.80		2.40	0.02
	Density (Density)	0.25	0.07	0.31	3.42	0.00
	Mixed Land Use (Diversity)	0.23	0.07	0.32	3.50	0.00
	Supporting Facilities (Design)	0.25	0.04	0.53	6.60	0.00
	High Density Area (High Density)	0.38	0.22	0.16	2.71	0.01
	Pedestrian Friendly (Walkable)	1.00	0.19	0.45	5.26	0.00
	Parking (Parking)	0.90	0.19	0.41	4.79	0.00
	Pedestrians (Pedestrian)	1.27	0.22	0.47	5.68	0.00
	Move (Transit)	0.78	0.20	0.33	3.72	0.00
a. Dependent Variable: Environment						

Source: Research Results

From the table above, it can be seen that the influence of the independent variables that affect the determination of the Transit Oriented Development (TOD) area in the city of Palembang are:

1. Hypothesis 1, there is an influence between density (density) on the environment. Obtained density (density) with a value of tcount 3.42 > ttable 1.98, meaning that Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between density (density) on the environment.
2. Hypothesis 2, there is an influence between mixed land use (diversity) on the environment. The obtained mixed land use (diversity) with a value of tcount 3.50 > ttable 1.98, meaning Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between mixed land use (diversity) on the environment.
3. Hypothesis 3, there is an influence between the supporting facilities (design) on the environment. Obtained supporting facilities (design) with a value of tcount 6.60 > ttable 1.98, meaning Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between supporting facilities (design) on the environment.
4. Hypothesis 4, there is an influence between the high density area (high density) on the environment. High area density is obtained with tcount 2.71 > ttable 1.98, meaning Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between high density area (high density) on the environment.
5. Hypothesis 5, there is an influence between pedestrian-friendly (walkable) on the environment. It is obtained that it is walkable with a value of tcount 5.26 > ttable 1.98, meaning Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between pedestrian-friendly (walkable) on the environment.
6. Hypothesis 6, there is an influence between parking (parking) on the environment. Parking is obtained with a value of tcount 4.79 > ttable 1.98, meaning Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between parking (parking) on the environment.
7. Hypothesis 7, there is an influence between pedestrians (pedestrians) on the environment. Pedestrians were obtained with a value of tcount 5.68 > ttable 1.98, meaning that Ha was accepted and H0 was rejected. Thus, it can be said that there is an influence between pedestrians (pedestrians) on the environment.
8. Hypothesis 8, there is an influence between moving (transit) to the environment. It is obtained that transfer (transit) with a value of tcount 3.72 > ttable 1.98, means that Ha is accepted and H0 is rejected. Thus, it can be said that there is an influence between moving (transit) on the environment.

Test F

To see simultaneously the effect of density (density), mixed land use (diversity), supporting facilities (design), high density (high density), pedestrian friendly (walkable), parking (parking), pedestrians (Pedestrian), and move (transit) on the environment the results obtained on the F test by comparing F count with F the description table below:

Table 9. F Test Results

ANOVA					
Model	Sum of Squares	df	Mean Square	F	Sig.

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1	Regression	658.43	8	82.30	6.64	0.00b
	Residual	1288,30	104	12.39		
	Total	1946.73	112			

a. Dependent Variable: Environment

b. Predictors: (Constant), Transit, High Density, Pedestrians, Mixed Land Use (Diversity), Parking (Parking), Walkable, Density, Facilities Support (Design)

Source: Research Results

From the results of data processing, it can be seen in table 9 above that the value of Fcount > Ftable is 6.64> 2.10. This means that H0 is rejected and Ha is accepted. Thus, it can be said that density, mixed land use (diversity), supporting facilities (design), high area density (high density), pedestrian friendly (walkable), parking (parking).), pedestrians (pedestrian), and moving (transit) together affect the environment.

After doing all the regression tests and all the data tests are met, then it can only be continued with the method of preparing the Process Hierarchy Analysis (AHP). By doing the first step, namely the preparation of the hierarchy as follows;

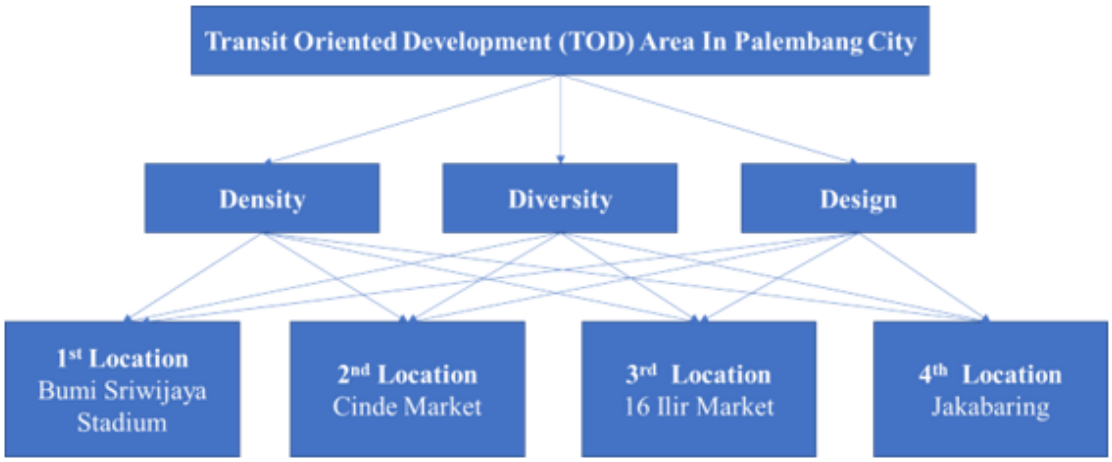

Figure 1. Hierarchy

After compiling the hierarchy, determine the priority of the elements by performing pairwise comparisons on the main criteria

Table 10. Pairwise Comparison Matrix Main criteria

Criteria	Density	Diversity	Design
Density	1	3	5
Diversity	0.33	1	3
Design	0.2	0.33	1
Amount	1.53	4.33	9

Field survey

The criteria matrix is obtained from the value of the row of items (a) / the number of each column of items.

Formula= (1/1.53) + (0.33/1.53) + (0.2/1.53)
= 0.65 + 0.21 + 0.13
= 1

This step is continued for rows and columns on the diversity and design criteria.

Table 11. Pairwise Comparison Matrix Main criteria

Criteria	Density	Diversity	Design
Density	1	2	3
Diversity	0.5	1	3
Design	0.33	0.33	1
Amount	1.83	3.33	7

Google forms

The criteria matrix is obtained from the row item value (a) / the number of each column item
Formula= (1/1.83) + (0.5/1.83) + (0.33/1.83)
= 0.54 + 0.27 + 0.18
= 1

This step is continued for rows and columns on the diversity and design criteria.
The results are attached in the table below:

Table 12. Pairwise Comparison Matrix Main criteria

Criteria	Density	Diversity	Design	Weights (W)
Density	0.65	0.69	0.56	0.63
Diversity	0.22	0.23	0.33	0.26
Design	0.13	0.08	0.11	0.11
Amount	1	1	1	1

Field survey

Table 13. Pairwise Comparison Matrix Main criteria

Criteria	Density	Diversity	Design	Weights (W)
Density	0.54	0.60	0.43	0.52
Diversity	0.27	0.30	0.43	0.33
Design	0.18	0.10	0.14	0.14
Amount	1	1	1	1

Google forms

Calculation of the value of weights (W) or priority is obtained from the number of lines divided by the number of criteria.
Formula = (0.54 + 0.60 +0.42) / 3
= 0.52

Then to determine the priority of each criterion and whether it is consistent or not, the following steps are taken:

Matrix Normalization

At this stage, the value of each column element will be summed and later each added element will be divided by the result of the corresponding column sum. The next step is to determine the priority value (Weights) for each criterion by adding up each row and dividing the result by many elements.

Table 14. Matrix Normalization Result

Criteria	Density	Diversity	Design	Weights (W)
Density	0.65	0.69	0.56	0.63
Diversity	0.22	0.23	0.33	0.26
Design	0.13	0.08	0.11	0.11

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Amount	1	1	1	1

Criteria	Density	Diversity	Design	Weights (W)
Density	0.54	0.60	0.43	0.52
Diversity	0.27	0.30	0.43	0.33
Design	0.18	0.10	0.14	0.14
Amount	1	1	1	1

Source: Research Results

Ratio Consistency Calculation

The calculation of the consistency ratio is carried out to test whether the priorities of the resulting criteria are consistent. The calculation is done by multiplying the values of the elements in the matrix with the corresponding priority. The results can be seen in the following table:

Table 15. Matrix Consistency Ratio

Criteria	Density	Diversity	Design	Ws = [C] XW
Density	1	3	5	1.95
Diversity	0.33	1	3	0.79
Design	0.2	0.33	1	0.32

Criteria	Density	Diversity	Design	Ws = [C] XW
Density	1	2	3	1.62
Diversity	0.5	1	3	1.02
Design	0.33	0.33	1	0.43

Source: Research Results

Next we look for the vector consistency value by dividing the Ws value by 1/W for that we will do a 1/W search as shown in the following table:

Table 16. Ratio Consistency Comparison Matrix

Criteria	Density	Diversity	Design	Ws = [C] XW	1/W	CV= Ws*(1/W)
Density	1	3	5	1.95	1.58	3.07
Diversity	0.33	1	3	0.79	3.84	3.03
Design	0.2	0.33	1	0.32	9.42	3.01

Criteria	Density	Diversity	Design	Ws = [C] X W	1/W	CV= Ws*(1/W)
Density	1	2	3	1.62	1.91	3.08
Diversity	0.5	1	3	1.02	2.99	3.06
Design	0.33	0.33	1	0.43	7.06	3.02

Source: Research Results

From the consistency value value, we will get a consistency ratio where we need to find the eigen value first (lambda) which is obtained from the average element in the cv column, then we look for

the index consistency value by (□-n)/(n-1) After getting the new index consistency value, we can find the consistency ratio value by dividing the index consistency by RI.

Table 17. Index Consistency Value

Lambda (λ):	3.04
CI:	0.02
RI:	0.58
CHARACTERISTIC:	0.03

Lambda (λ):	3.05
CI:	0.03
RI:	0.58
CHARACTERISTIC:	0.05

From the resulting consistency ratio data, a small value of 0.1 means that the data is consistent.

Table 18. Density Criteria

Density	**Sriwijaya Earth Stadium**	**Cinde Market**	**Market 16 Ilir**	**Jakabaring Stadium**
Bumi Sriwijaya Stadium	1	2	0.33	3
Cinde Market	0.5	1	0.33	2
Market 16 Ilir	3	3	1	5
Jakabaring Stadium	0.33	0.5	0.2	1
Amount	4.83	6.5	1.87	11

Source: Research Results

CR: 0.02

Density	**Sriwijaya Earth Stadium**	**Cinde Market**	**Market 16 Ilir**	**Jakabaring Stadium**
Bumi Sriwijaya Stadium	1	2	0.33	3
Cinde Market	0.5	1	0.2	4
Market 16 Ilir	3	5	1	7
Jakabaring Stadium	0.33	0.2	0.14	1
Amount	4.83	8.2	1.68	15

Source: Research Results

CR: 0.04

Table 19. Diversity Criteria

Diversity	**Sriwijaya Earth Stadium**	**Cinde Market**	**Market 16 Ilir**	**Jakabaring Stadium**
Bumi Sriwijaya Stadium	1	2	0.5	8
Cinde Market	0.5	1	0.33	3
Ilir Market	2	3	1	5
Jakabaring Stadium	0.12	0.33	0.2	1
Amount	3.62	6.33	2.03	17

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Source: Research Results

CR: 0.04

Table 20. Diversity Criteria

Diversity	Sriwijaya Earth Stadium	Cinde Market	Market 16 Ilir	Jakabaring Stadium
Bumi Sriwijaya Stadium	1	3	0.33	3
Cinde Market	0.33	1	0.33	2
Market 16 Ilir	3	3	1	3
Jakabaring Stadium	0.33	0.25	0.33	1
Amount	4.67	7.25	1.99	9

Source: Research Results

CR: 0.08

Table 21. Design Criteria

Design	Sriwijaya Earth Stadium	Cinde Market	Market 16 Ilir	Jakabaring Stadium
Bumi Sriwijaya Stadium	1	2	0.33	3
Cinde Market	0.5	1	0.33	4
Market 16 Ilir	3	3	1	5
Jakabaring Stadium	0.33	0.25	0.2	1
Amount	4.83	6.5	1.87	11

Source: Research Results

CR: 0.06

Design	Sriwijaya Earth Stadium	Cinde Market	Market 16 Ilir	Jakabaring Stadium
Bumi Sriwijaya Stadium	1	2	0.33	4
Cinde Market	0.5	1	0.33	3
Market 16 Ilir	3	3	1	3
Jakabaring Stadium	0.25	0.33	0.33	1
Amount	4.75	6.33	1.99	11

Source: Research Results

CR: 0.09

The results of calculations using the AHP method do Transpose vector W (priority) from each alternative, after transpose everything then do the alternative ranking, namely the result of multiplying each alternative weight column with the corresponding criterion weight column.

Table 22. Calculation Results for AHP Transpose Vector W

Combined Weight	Bumi Sriwijaya Stadium	Cinde Market	Market 16 Ilir	Jakabaring Stadium	Criteria Weight

Overall					
Density	0.24	0.15	0.52	0.09	0.63
Diversity	0.33	0.16	0.45	0.06	0.26
Design	0.23	0.19	0.50	0.07	0.11
Ranking	0.26	0.16	0.49	0.08	1

Combined Weight	**Bumi Sriwijaya Stadium**	**Cinde Market**	**Market 16 Ilir**	**Jakabaring Stadium**	**Criteria Weight**
Overall					
Density	0.21	0.15	0.57	0.06	0.52
Diversity	0.28	0.15	0.47	0.10	0.33
Design	0.26	0.18	0.47	0.09	0.14
Ranking	0.24	0.16	0.52	0.08	1

From the ranking calculation data above, the highest results are obtained in the Pasar 16 Ilir area, which means that the largest possibility for the TOD (Transit Oriented Development) area is the Pasar 16 Ilir area.

CONCLUSION

Based on the results of research on "Analysis of Determination of Transit Oriented Development (TOD) Areas in Palembang City in terms of Environmental Aspects", it can be concluded that: 1) Factors that have a positive and significant impact on environmental aspects for choosing a Transit Oriented Development (TOD) location based on the results of google form data are density, shared land use (diversity), supporting facilities (design), high density area), friendly to pedestrians (walkable), parking (parking), pedestrians (pedestrian), and moving (transit). 2) The location that has the potential to become a Transit Oriented Development (TOD) area in Palembang City is the Pasar 16 Ilir area (location 3). This area has the highest potential from other areas after AHP data processing was carried out on the three main criteria for determining the TOD area in the Sriwijaya Earth Station, Cinde Market, 16 Ilir Market, and Jakabaring Stadium. So that the determination of the area that has the potential to become a Transit Oriented Development (TOD) area in Palembang City is the Pasar 16 Ilir area. This is because the 16 Ilir Market has the highest percentage obtained after processing the AHP data. 3) To evaluate the determination of the TOD area in Palembang City, it focuses on the three main criteria, namely density, diversity and design. These three main criteria are very much needed to be rearranged in the Pasar 16 Ilir area to be able to make the area a friend of Transit Oriented Development (TOD).

SUGESTIONS

Based on the process of implementing and analyzing this research, the author has high hopes for future researchers so that this research can greatly assist other researchers in studying the same thing. In the continuation and implementation of the results of this research, the researcher hopes several things, including: 1) Evaluation, Factors and Determination of the TOD area can be used to determine the success of the regional and spatial development of Palembang City as a Transit Oriented Development (TOD) area. 2) This research can be developed with a similar method but with more complex variables for a new area with a more micro context (the importance of urban design) so that future researchers can find things that researchers have missed before. 3) With the results of this study, the researcher hopes that the operators of LRT and administrators of Palembang

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City can make this research an evaluation and determine the factors to realize the Transit Oriented Development (TOD) area.

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