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Analysis of Public Transportation Mode Choices in Tangerang City, Indonesia

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ABSTRACT

Mode choice of transportation is a transportation planning process that functions in determining travel expenses or can be interpreted as an effort to separate people's travel to understand the relationship between modes and a factor that influences the choice of other modes. This study aims to determine the mode choice of public transportation and the probability of using the Tayo Bus and City Transportation in Tangerang City. The research approach used is quantitative with primary data sources obtained from closed questionnaire instruments with stated preference techniques for 50 respondents using the Tayo Bus on the Ciledug-Tang City route and 50 respondents using the City Transportation for the Ciledug-Cikokol route. The analysis of mode choice uses the binomial logit model with attribute variables in the form of changes in travel costs, changes in travel time, and changes in headway. The results of the analysis show that the probability of mode choice for the changes in these attributes is 92.107% or Tayo Bus and 7.893% for City Transportation. The main factor that underlies the opportunity to choose the Tayo Bus is the cheaper cost than City Transportation, while the opportunity for choosing City Transportation the ease of access felt by passengers. Changes in the attributes of travel costs in both modes are increased or decreased, passengers generally prefer to use the Tayo Bus. Likewise with the attributes of travel time and headway, although it is increased or decreased, passengers tend to prefer to use the Tayo Bus as a mode to get their destination

Keywords: mode choice, stated preference,and binomial logit model.

INTRODUCTION

The history of transportation is rich and evolving (Ekwonwune et al., 2018). Transportation is a process that moves people from one place to another (Abdel Wahid Ahmed & Abd El Monem, 2020) and transportation is a movement that is used to make it easier for humans to carry out daily activities (Tamin, 2008). Transportation is a requirement for every nation, regardless of its industrial capacity, population size, or technological development (Igwe, C.N et al., 2013). Transportation is the lifeblood of the nation and state which acts as a driver and supporter of development (Dodi & Nahdalina, 2019). Public transport is a sustainable model of transportation that reduces both increasing levels of pollution and traffic congestion statistically, to identify factors influencing mode choice, introduce bicycles as an alternative to travel using a discrete choice model (Dodi & Nahdalina, 2019). Therefore, the mode choice of transportation is one of the most important classical models in transportation planning (Ortuzar & Willumsen, 1994).

The types of transportation used can include walking or using vehicles, such as private vehicles, motorbikes, cars, or public transportation such as buses, city transportation, rickshaws, trains, and so on (Wahab, 2019). The choice of a mode of transportation was chosen because of the shortest route or fastest time or low cost or a combination of the three (Haradongan, 2014).

Another influencing factor is safety and discomfort (Zahara & Lubis, 2018).

In determining the choice of type of transportation, various factors or variables will also be considered, namely the purpose of the trip, the distance traveled, the cost, and the level of comfort (Tamin, 2008).

The transportation mode is very much needed, especially for areas experiencing regional development such as Tangerang City where the population continues to grow which affects the level of need for transportation services (Suyadi et al., 2021). Therefore, to support the activities of the people in Tangerang City, City Transportation is operated. For example, City Transportation in Tangerang City with routes that can help to reach the destination. City Transportation can be distinguished by the color and number printed on the car body, one of which is the B02 City Transportation with the Ciledug – Cikokol route with a route that passes through the TangCity intersection which is in great demand.

To meet the needs for public transportation, the Tangerang City Government through the Department of Transportation introduced Bus Rapid Transit (BRT). Public transportation in Tangerang City is now made much safer and more comfortable. Many people use public transportation managed by the Tangerang City Government for their daily activities. Therefore, this study aims to analyze the mode choice of public transportation in Tangerang City between City Transportation on the Ciledug – Cikokol route with the Tayo Bus on the Ciledug – TangCity route and the probability of passengers choosing the two modes by taking into variables changes in the attributes of travel cost, changes in travel time, and change in headway.

LITERATURE REVIEW

Mode Choice Model

Modeling is an important part of most decision-making processes (Almasri & Alraee, 2013). Transport modeling is used to determine the effects of behavior change and to determine the impact of infrastructure improvements (Al-Salih & Esztergár-Kiss, 2021). In the four-step travel demand modeling process, mode choice models compute the proportion of trips that use a specific transportation mode (Kim et al., 2020) and the mode of transportation is a way to move from one place to another (Widyaningsih & Daniel, 2019). The mode choice model aims to determine the proportion of people who will use each mode (Tamin, 2008). Spatial determinants that affect the choice of modes of land use structure, accessibility to a particular mode of origin, time fac, tor, and the cost of using that mode of transportation (Witchayaphong et al., 2020). Factors that can affect the choice of this mode can be grouped into four, namely the characteristics of road users, characteristics of the movement, characteristics of transportation mode facilities, and characteristics of the city. The travel mode choices most frequently cited were individual demographics, including age, gender, education level, employment status, and driver's license availability (Bhat, 1998; Bhat & Srinivasan, 2005; Li et al., 2013; Yang et al., 2013). The mode choice process is carried calculating the model by knowing the independent variables (attributes) that affect the choice model mode.

Binomial Logit Model

Ben-Akiva et al., in 1985 said that the logit family is a class of econometric models based on random maximize utility (Zhao et al., 2020). Mode Choice modeling can be viewed as a classification problem, providing an alternative to logit models (Zhao et al., 2020) and this binomial logit model can only be used to find the probability of two modes of transportation choice (Miro, 2005). The utility of the model is presented in equation (1).

$U_{BT}–U_{CT} = a+b_1X_1+ \ldots+b_nX$…….. (1)

$U_{BT}–U_{CT}$ = Value of utility of both modes

a = Parameter constant

b_1 s/d b_n = Regression parameter

X_1 s/d X_n =Variables that affect

To obtain the coefficients and constants based on the regression method is using the SPSS program. After the constant and each coefficient are obtained, then based on the value of the regression coefficient, can be seen the relative effect of each attribute or independent variable on all utilities.

MATERIALS & METHODS

The approach used in this research is quantitative. The population for mode choice is passengers on the Ciledug –Tangcity route using the Tayo Bus and City Transportation, with samples taken from 50 respondents from Tayo Bus passengers and 50 respondents from City Transportation passengers. The type of data used in this study is primary data obtained from the distribution of questionnaires to respondents. The purpose of using the questionnaire is to obtain the cost, travel time, and headway of each mode. The questionnaire distributed to respondents consisted of 2 parts, namely questions aimed at informing respondents of the actual results of attributes that affect mode choice and changes. Description of the attributes on the mode are:

a. travel costs (X1) are costs that must be incurred for payment of transportation costs in rupiah per person, which is the cost of travel from CBD Ciledug – TangCity.
b. travel time (X2) is the time required to travel in hours from the CBD Ciledug – TangCity.
c. Headway (X3) is the distance when the vehicle departs from a stop or station, between one mode and the next.

The results of the questionnaire were analyzed using SPSS with reliability tests and validity tests on the data that had been obtained. This is done to measure whether a question item is found or not. For the reliability test, a questionnaire is said to be reliable if Cronbach's Alpha value > 0,6. To test the validity, use the r table to measure the validity of a question.

The transformation process is carried out to change the respondents' answers in the form of qualitative data into quantitative data so that an analysis of the data that has been obtained can be carried out. The data change is based on a certain numerical scale. Determination of the numerical scale of the respondents' answers is based on the linear equation of the binomial logit model.

Hypothesis testing on utility value variations (F-test) was carried out to ensure the effectiveness of all attributes contained in the utility difference equation together by comparing F arithmetic and F table. Hypothesis testing on regression (t-test) is carried out to ascertain whether or not there is an independent variable on the dependent variable, testing using at-table. Then the R square test, this test is carried out to determine and predict how big or important the contribution of the influence given by the independent variables together to the dependent variable.

RESULT

Characteristics of Respondent in Choosing Mode: Respondents in this study were people in Tangerang City who used the Tayo Bus and City Transportation in the CBD Ciledug – TangCity route. The distribution of modes that have been used by respondents can be seen in the following tables:

Table 1. Characteristics Based in Mode Ever Used

No.	Modes Used	Frequency	%
1	Ever used both modes	75	75
2	Ever used one mode	25	25
Total		**100**	**100**

Source: Data processed results, 2022

Table 1 shows the average of modes used by respondents. Of the 100 respondents in Tangerang City who stated that they had used both modes, as many as 75% and 25% stated that they had used one of the modes.

Table 2. Characteristics of Mode User by Gender

No.	Modes Used	Frequency	%
1	Male	49	49
2	Female	51	51
Total		**100**	**100**

Source: Data processed results, 2022

Based on table 2, the characteristics of respondents in Tangerang City are 49% male and 51% female respondents.

Based on the reasons for choosing the mode in table 3, all 50 samples of respondents chose to use the City Transportation because of the ease of access.

Table 3. Characteristics of Mode User Based on Reason for Choosing Mode

No	Considerations for choosing	Tayo Bus		City Transportation		Total
		Frequency	%	Frequency	%	
1	Speed/ time	5	10	50	100	5
2	Ease of access	0	0	0	0	50
3	Safety and security	6	12	0	0	6
4	Travel costs	28	56	0	0	28
5	Comfort	11	22	0	0	11
	Total	**50**	**100**	**50**	**100**	**100**

Source: Data Processed Results, 2022

Table 4. Attributes of Actual Model and Service

No.	Attributes	Tayo Bus	City Transportation
1	Travel costs for the CBD Ciledug – TangCity route	Rp. 2000,-	Rp. 8000,-
2	Travel time for the CBD Ciledug – TangCity route	30 – 45 minutes	50 – 60 minutes
3	Headway for the CBD Ciledug – TangCity route	Every ± 7 minutes	Every ± 2 minutes

Source: Field Survey Results, 2022

Meanwhile, the reason for the 50 respondents using the Tayo Bus are considerations for the speed of time as much as 10%, 12% for safety and security, 56% for travel costs, 11% for comfort, and 0% for ease of access.

Cost, Travel Time, and Headway

This survey was conducted to obtain data on the variables that will be used in the research questionnaire. The results of the data obtained in the field can be seen in table 4.

Reliability Test

This reliability test aims to measure the consistency of one's answers to the question items in the questionnaire. A questionnaire is said to be reliable if the value of Cronbach's Alpha > 0.60. Based on table 5, it is known that the SPSS calculation results for the question items asked (Q1-Q15) are 0.906. Thus, the questionnaire is reliable because the value is 0.906 > 0.06.

Table 5 Statistical Reliability

Cronbach's Alpha	N of items
0.906	15

Source: Analysis results, 2022

Validity Test

A validity test is evidence that the instrument, technique, and or process used to measure a question measures the intended concept, this test aims to measure the validity of a question item. An item is said to be valid if the corrected item's total correlation (r count) is greater than the r table. It is known that the value of r table (df = n – 2 = 100 – 2, 95% significance level) is 0.1966. Based on table 6, in the corrected item-total correlation, all values for each question are greater than 0.1966. Thus, each question that was asked to find the probability of mode choice was significant or passed the test using SPSS version 25, so that no questions were changed or discarded.

Table 6. Instrument Validity Test Results

	Scale means if an item deleted	Scale variance if item deleted	Corrected item-total correlation	Cronbach's alpha if an item deleted
Q1	30.74	159.588	0.800	0.892
Q2	30.92	163.953	0.804	0.892
Q3	31.27	173.936	0.777	0.895
Q4	31.65	189.159	0.446	0.906
Q5	31.10	192.535	0.203	0.911
Q6	30.80	157.010	0.787	0.892
Q7	30.71	157.481	0.779	0.893
Q8	30.59	162.325	0.718	0.896
Q9	30.61	170.240	0.670	0.897
Q10	30.45	171.543	0.621	0.899
Q11	31.19	178.297	0.566	0.901
Q12	31.25	178.715	0.546	0.902
Q13	31.60	182.626	0.482	0.904
Q14	32.08	193.711	0.269	0.909
Q15	32.08	193.711	0.269	0.909

Source: Analysis Results, 2022

Data Processing

The transformation process is carried out to change the respondent's answers in the form of qualitative data into quantitative data so that analysis can be carried out on the data that has been obtained. The data changes are made based on a certain numerical scale. Determination of the numerical scale of respondents' answers is based on the linear equation of the binomial logit model (Tamin, 2008). The natural logarithmic equation is as follows:

Table 7 Numerical Scale Values Based on Respondents' Choice

Values of the probability scale	Values of logarithmic natural	Point rating
0,9	2,1972	1. Definitely choose the Tayo Bus
0,7	0,8473	2. Maybe choose the Tayo Bus
0,5	0,0000	3. Balanced option
0,3	-0,8473	4. Maybe choose City Transportation
0,1	-2,1972	5. Definitely choose City Transportation

Source: Processed Data Results, 2022

a. The probability scale value represented by the rating points 1, 2, 3, 4, and 5 is for example the standard scale value, namely 0.9; 0.7; 0.5; and 0.1.

b. By using the linear transformation of the binary logit model, a numerical scale value can be obtained for each choice probability (Table 7).

After data transformation is obtained, the survey data is calculated on the respondents' choices for changes in one of the attributes for respondents based on the existing mode conditions in the results of the preliminary survey.

The explanation based on table 8 is as follows:

a. Respondent 1, the cost of travel/cost (X1) is obtained from changes in the attributes of travel costs, namely the difference between the costs of the Tayo Bus and City Transportation (Angkot). It can be seen in column 5, in option 1a, it is known that the Tayo Bus and Angkot travel costs are 1500 – 4500 = -3000. Meanwhile, the travel time (X2) remains at the current mode condition, namely, the difference in travel time between the Tayo Bus and Angkot which is 35 – 55 = -20 minutes, then the waiting time/ headway (X3) remains in the current mode condition, namely the difference Departure schedule between Tayo Bus and Angkot is 7 – 2 = 5 minutes. Option 1a shows a point rating of 1 (definitely choose the Tayo Bus) with a numerical scale value based on mode users of 2.1972.

Table 8 Data from Research Questionnaire Survey Results

Choice	Point rating	Numerical scale value	Cost (X1)	Time travel (X2)	Head way (X3)
1a	1	2,1972	-3000	-20	5
1b	1	2,1972	-3000	-20	5
1c	1	2,1972	-500	-20	5
1d	3	0,0000	0	-20	5
1e	1	2,1972	0	-20	5
2a	1	2,1972	-6000	0	5
2b	1	2,1972	-6000	0	5
2c	1	2,1972	-6000	-5	5
2d	1	2,1972	-6000	0	5
2e	1	2,1972	-6000	-5	5
3a	1	2,1972	-6000	-20	1
3b	1	2,1972	-6000	-20	3
3c	1	2,1972	-6000	-20	2
3d	1	2,1972	-6000	-20	0
3e	1	2,1972	-6000	-20	0

Source: Analysis Results, 2022

b. In option 2a, travel time (X2) is obtained based on changes in the travel time attribute, namely 30 – 30 = 0 minutes. While the cost of travel/ cost (X1) remains at the initial condition, namely the difference between the cost of the Tayo Bus and Angkot trips is 2000 – 8000 = -6000. Furthermore, the waiting

time/ headway (X3) remains at the current mode condition, namely the difference in the departure schedule between Tayo Bus and Angkot, which is 7 – 2 = 5 minutes. The calculation method is as in option 1a.

c. In option 3a, the waiting time/ headway (X3) is obtained based on changes in the waiting time attribute, which is every 3 – 2 = 1 minute. Meanwhile, the cost of travel

(X1) and waiting for time/ headway (X3) remains in the current condition. The calculation method is as in option 1a.

Statistical F Test

Hypothesis testing on utility value variations (F-test) is carried out to ensure the effectiveness of all attributes contained in the utility difference equation.

Table 9 ANOVA Test Output on SPSS Version 25

Model	Sum of Square	Df	Mean square	F	Sig.
Regression	7.219	3	2.406	12.992	0.000[b]
Residual	17.781	96	.185		
Total	25.000	99			

Source: Analysis Results, 2022

From the Anova test (table 9) or F test by entering all the attributes in the comparison between Tayo Bus and Angkot, it is found that the F count is 12,992. Because the value of $F_{count} > F_{table}$ (4%, Df1 = 3, Df2 = 100 – 3 – 1 = 96) or 12,992 > 2.7 and P-value < 0.05, then H_0 rejected and H_1 accepted. Thus, travel costs (cost), travel time (travel time), and waiting time (headway) together affect the utility of mode choice.

Statistical t-Test

Testing the hypothesis on regression (t-test) was conducted to ascertain whether or not the independent variable affected the dependent variable. The results of the t-test of each attribute are shown in table 9 as follows:

Table 10 Results of t-test for Regression Coefficient

Model	t-count	Sig.	Conclusion
X1	3,726	.000	H_0 rejected and H_1 accepted
X2	-.272	.787	H_0 accepted and H_1 rejected
X3	2.373	0.02	H_0 rejected and H_1 accepted

Source: Analysis Results, 2022

Based on the calculation of the t table (df = n – k = 100 – 4 = 96) obtained a value of 1.98498, it can be stated from the three attributes as presented in Table 9 that only the time travel (X2) does not affect the mode choice variable because of the value $t_{count} < t_{table}$. The variable cost (X1) and headway (X2) have a significant influence on the choice of mode because the value of $t_{count} > t_{table}$.

Statistical R Square Test (R^2)

Based on the results of statistical test analysis with SPSS, the value of R2 is presented in table 11. Information that can be concluded from Table 11 is the value of $R^2 = 0.289$. Thus, the attributes cost (X1), time travel (X2), and headway (X3) have an effect of 28.9% in determining the choice of model used from CBD Ciledug – TangCity Mall.

Table 11 Result of R^2 tes

Model	R	R Square	Adjusted R Square	Std. The error in the Estimate
1	.537[a]	.289	.267	.430

Source: Analysis Results, 2022

Mode Choice Model Analysis

The results of the analysis of SPSS version 25, obtained an equation for the difference in utility between the Tayo Bus and the Angkot for the CBD Ciledug – TangCity route. The results are shown in Table 12.

Table 12 SPSS Outcome Test Results for Utility Equation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	-.152	.116		1.308	.000
Cost	.042	.011	-.444	3.726	.000
Time Travel	-.002	.008	.032	-.272	.787
Headway	.025	.010	.218	2.373	.020

Source: Analysis Results, 2022

Based on table 12, the equation for the difference in utility between the Tayo Bus and Angkot is:

$(U_{BT} – U_{Ang}) = -0.152 + 0.042\ (X1) – 0.002\ (X2) + 0.025\ (X3)$……(2)

Furthermore, the difference in utility for option 1a is as presented in table 12 can be analyzed and the difference in utility for 1a is as follows:

$(U_{BT} – U_{Ang}) = -0.152 + 0.042\ (-3000) – 0.002$

(-20) + 0.025 (5) = -125.627

Details:

U_{BT} = Utility or value Tayo Bus mode Choice

U_{Ang} = Utilities or City Transport mode choice

Furthermore, the calculation of the probability analysis of mode choice can be done using the formula:

Probability of choosing the Tayo Bus mode:

P_{BT} = = 1.00

P_{Ang} = 1 – PAng = 1 – 1 = 0.00

Remarks:

P_{BT} = Probability of mode choice of the Tayo Bus

P_{Ang} = Probability of choosing the mode of City Transport.

The calculation results for the probability of selecting the mode based on attribute changes are shown in table 13.

Table 13 Probability of Mode Choice based on Changes in Attribute

Choice	X1	X2	X3	$U_{BT} - U_{Ang}$	P_{BT}	P_{BT} (%)	P_{Ang}	P_{Ang} (%)
1a	-3000			-125.627	1.00	100	0	0
1b	-3000			-125.627	1.00	100	0	0
1c	-500			-20.63	1.00	100	0	0
1d	0			0.373	0.408	40.8	0.592	59.2
1e	0			0.373	0.408	40.8	0.592	59.2
2a		0		-252.03	1.00	100	0	0
2b		0		-252.03	1.00	100	0	0
2c		-5		-251.93	1.00	100	0	0
2d		0		-252.03	1.00	100	0	0
2e		-5		-251.93	1.00	100	0	0
3a			1	-251.727	1.00	100	0	0
3b			3	-251.677	1.00	100	0	0
3c			2	-251.702	1.00	100	0	0
3d			0	-251.752	1.00	100	0	0
3e			0	-251.752	1.00	100	0	0
Probability Average					0.92107	92.107	0.07893	7.893

Source: Analysis Results, 2022

DISCUSSION

Travel Costs (Cost)

Based on the results of the analysis in table 13, the mode choice model obtained the probabilities for each mode for attribute changes to travel costs (cost) and other attributes remain as follows:

a. For changes in the attribute of travel costs in option 1a between the Tayo Bus and City Transportation with a difference of Rp. 3000, while the difference in other attributes remains according to the actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so the Tayo Bus mode is more favorite than City Transportation mode.

b. For changes in the attribute of travel costs in option 1b between the Tayo Bus and City Transportation with a difference of Rp. 3000, while the difference in other attributes remains according to the actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so the Tayo Bus mode is more favorite than City Transportation mode.

c. For changes in the attribute of travel costs in option 1c between the Tayo Bus and City Transportation with a difference of Rp. 500, while the difference in other attributes remains by the actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so the Tayo Bus mode is more favorite than the City Transportation mode.

d. For changes in the attribute of travel costs in the 1d option between the Tayo Bus and City Transportation with a difference of Rp. 0, while the difference in other attributes remains by the actual conditions, the probability for Tayo Bus is 40.8% and City Transportation is 59.2% so that City Transportation mode is more favorite than Tayo Bus mode.

e. For changes in the attribute of travel costs in option 1e between the Tayo Bus and City Transportation with a difference of Rp. 0, while the difference in other attributes remains by the actual conditions, the probability for Tayo Bus is 40.8% and City Transportation is 59.2% so that City Transportation mode

is more favorite than Tayo Bus mode.

Travel Time

Based on the results of the analysis in table 13, the mode choice model obtained the probabilities for each mode for attribute changes to travel time and other attributes remain as follows:

a. For changes in travel time attributes in choice 2a between Tayo Bus and City Transportation with a time difference of 0 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
b. For changes in travel time attributes in option 2b between Tayo Bus and City Transportation with a time difference of 0 minutes while the other attribute differences remain by actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
c. For changes in travel time attributes in choice 2c between Tayo Bus and City Transportation with a time difference of -5 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
d. For changes in the travel time attribute in the 2d option between Tayo Bus and City Transportation with a time difference of 0 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
e. For changes in the attributes of travel costs in choice 2e between Tayo Bus and City Transportation with a time difference of -5 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.

Distance of Departure Time (Headway)

Based on the results of the analysis in table 13, the mode choice model obtained the probability for each mode to change attributes at the time of departure (headway) and other attributes remain as follows:

a. For changes in the departure time distance attribute in choice 3a between Tayo Bus and City Transportation with a time difference of 1 minute while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
b. For changes in the departure time distance attribute in choice 3b between Tayo Bus and City Transportation with a time difference of 3 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
c. For changes in the departure time distance attribute in choice 3c between Tayo Bus and City Transportation with a time difference of 2 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
d. For changes in the departure time distance attribute in the 3d choice between Tayo Bus and City Transportation with a time difference of 0 minutes while the other attribute differences remain according to actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.
e. For changes in the departure time distance attribute in choice 3e between Tayo Bus and City Transportation with a time difference of 0 minutes while the other attribute differences remain according to

actual conditions, the probability for Tayo Bus is 100% and City Transportation is 0% so that the Tayo Bus mode is more favorite than City Transportation mode.

CONCLUSION

The conclusion in this study is based on all attributes, the Tayo Bus mode has a probability of being selected at 92.107% while the City Transport mode has a 7.893% probability to be selected. This is because some of the most important factors are the cost of traveling using the Tayo Bus which is cheaper than the City Transportation mode. The opportunity for respondents to choose to use the City Transportation mode is due to the perceived ease of access compared to the Tayo Bus. Even so, changes in the attributes of travel costs in both modes are increased or decreased, people generally prefer to use the Tayo Bus as a mode to get to their destination. Likewise, the attributes of the travel time and the distance attribute of departure time, even if they are increased or decreased, people tend to prefer to use the Tayo Bus as a mode to get to their destination.

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