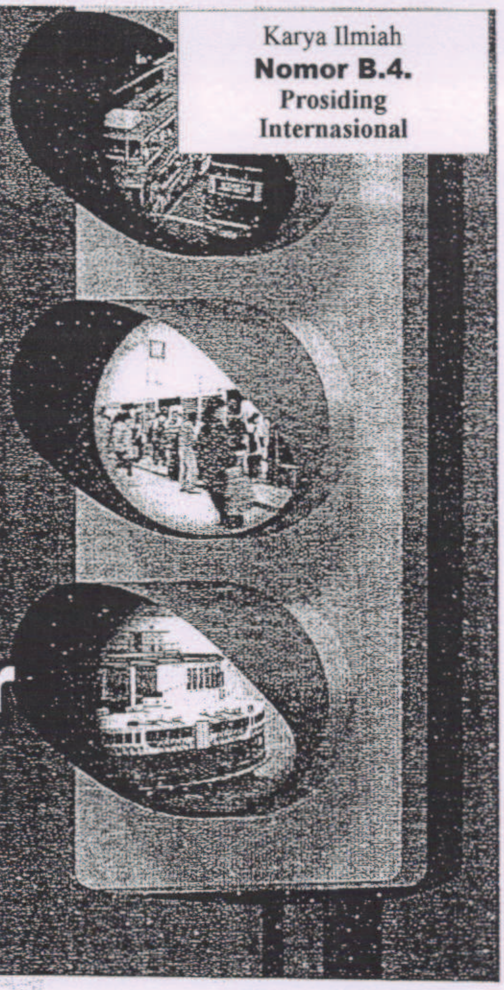

The 11th International Conference on Advanced Systems for Public Transport (CASPT09)

20-22 July, 2009 • Hong Kong

Editors
Hong K. Lo
William H. K. Lam
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Janny Leung

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20 – 22 JULY 2009, HONG KONG

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20 July 2009 (Monday)

		Abstract
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22 July 2009 (Wednesday)

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EXPLORING USER BEHAVIOR ON THE TRANSJAKARTA BUSWAY USING THE STATED PREFERENCE METHOD

Tri Basuki JOEWONO [a*], Adi Prasetio RAHARJO [b] and Almeida Andes SUDRADJAT [c]

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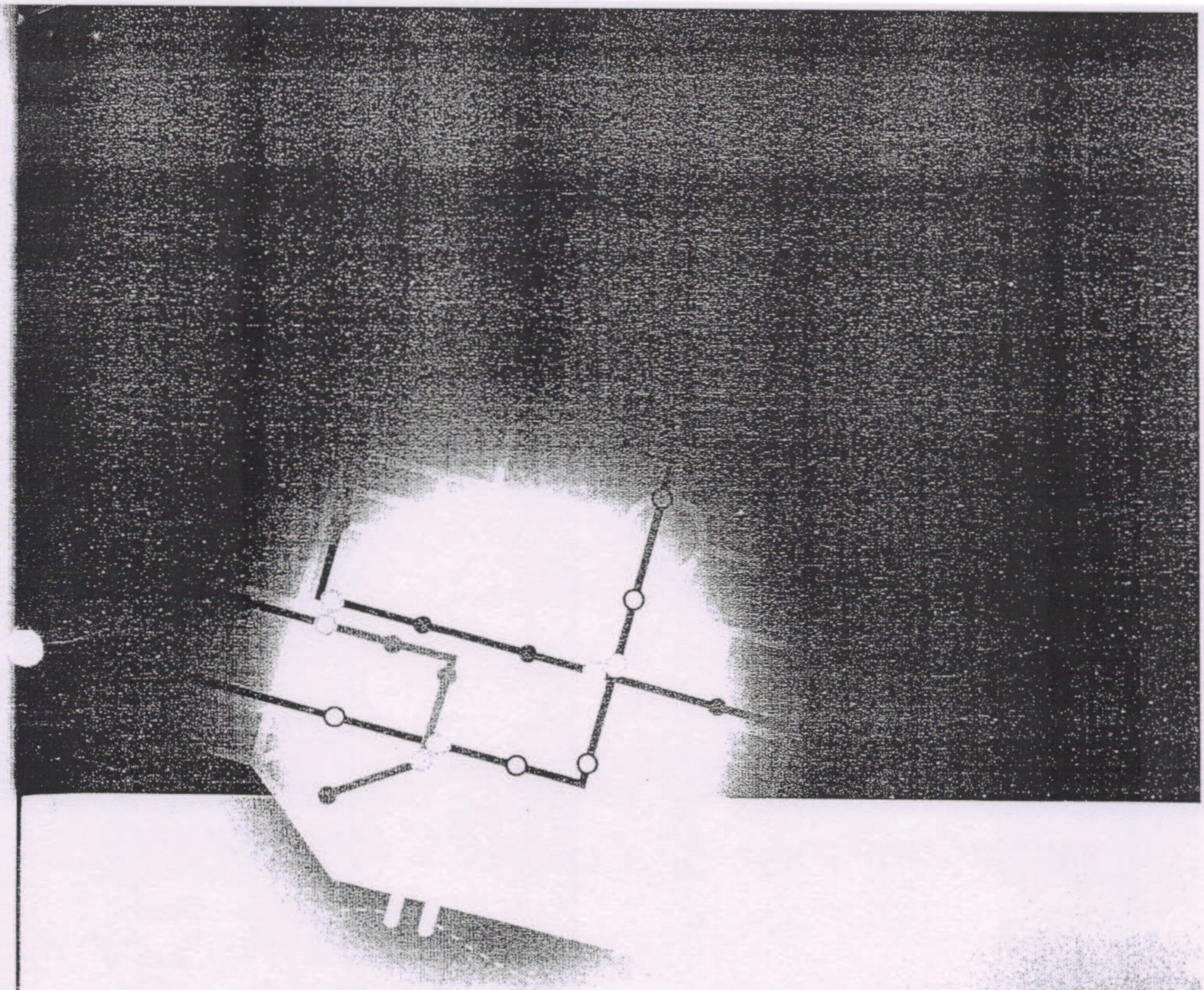
ABSTRACT

Bus rapid transit (BRT) has been implemented since 2004 and currently well known as the TransJakarta Busway. The decision to implement BRT in Jakarta has been believed as the right approach. On the other hand, the future of this BRT's service should be anticipated by conducting a well founded study, as well as before implementing new public transportation, whether it is LRT or MRT. The objectives of this study are to elaborate the user preference in the time the existence of modes competition and to corroborate the reaction of the user when there is a change of service attribute in the future. The model estimate finds that age and income influence significantly the user choice. The analysis also elaborates the effect of attributes changes to the user preference, namely fare, waiting time, and riding time. It illustrates the potential of BRT when competes with LRT and MRT in the future.

Keywords: Busway, Stated Preferences, User Behavior, Multinomial Logit Model



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Abstract

Bus rapid transit (BRT) has been implemented since 2004 and currently well known as the TransJakarta Busway. The decision to implement BRT in Jakarta has been believed as the right approach. On the other hand, the future of this BRT's service should be anticipated by conducting a well founded study, as well as before implementing new public transportation, whether it is LRT or MRT. The objectives of this study are to elaborate the user preference in the time the existence of modes competition and to corroborate the reaction of the user when there is a change of service attribute in the future. The model estimate finds that age and income influence significantly the user choice. The analysis also elaborates the effect of attributes changes to the user preference, namely fare, waiting time, and riding time. It illustrates the potential of BRT when competes with LRT and MRT in the future.

Keywords: Busway, Stated Preferences, User Behavior, Multinomial Logit Model

1. INTRODUCTION

Most developing countries do not have a proper mass transportation system to suppress the rapid growth of motorization in urban areas, which is unlike developed countries. This is also the case for Jakarta, which explains the reason why Jakarta has been facing heavy congestion problems (see Susilo et al., 2007 for more discussion regarding the relationship between motorization and public transport in Jakarta, Indonesia). To solve this serious problem, the implementation of a proper urban public transportation is a potential solution.

As a matter of fact, bus rapid transit (BRT) has been implemented since 2004, and is currently well known as the TransJakarta Busway. The decision to implement BRT in Jakarta has been argued about as the right approach. On the other hand, the future of this service should be anticipated. The success of this mode will influence the future face of urban transport in Jakarta.

This anticipation should cover all facets of the future operation and service of TransJakarta Busway, e.g. the competition of this mode with other new modes, or the change of user preference in a new situation. Thus, a well founded study is needed to anticipate the future change, as well as before implementing new public transportation, whether it is LRT or MRT. In Jakarta, there was a long term plan to build a monorail as well as subway (Tempo, 2005), although the implementation is still facing huge constraints. Since there is a uniqueness about each urban area, as well as travel behavior, a collection of comprehensive knowledge of how the public will react is a must before its actual implementation. The community's needs and characteristics form a requirement for the success of the public transport industry (see Hensher and Brewer, 2001 for discussion regarding transportation business). Transport operators and policy makers need to have a clear idea of the likely effect of any considered investment or planning strategy.

Jakarta needs this kind of study, which should have the ability to explore the future user preference as well as user behavior in future situations. Thus, the result should also be used to win the competition, i.e. retain current users and attract new users. However, the demand studies can be the most costly component (Wright, 2002). It poses the researcher with a challenge to select the best method of data collection. The method should be able to provide valid and reliable data, where the cost should be feasible, manageable to be implemented, and have a wide application for the decision making process.

With this background, the motive of this research is to establish a study which is useful to develop an anticipation program for the operator of BRT, as well as the government. Thus, the objectives of this study are to elaborate the user preference in the time when the mode competitor becomes available and to corroborate the reaction of the user when there is a change of service attribute in the future. The study will apply the stated preference (SP) method in developing the questionnaire survey as a way to collect data. The targeted object is the passenger of the TransJakarta Busway. Analyses will be completed by estimating the multinomial logit model.

The structure of this article is as follows. After this introduction section, a brief description regarding the TransJakarta Busway is provided in second section. Section three consists of the explanation regarding questionnaire development and distribution, including data description. Section four explains the model estimation and user behavior, as well as the discussion. The last section concludes the analysis.

2. THE TRANSJAKARTA BUSWAY

In Indonesia, TransJakarta Busway is a new transportation system compared with TransMillenio in Bogota that started almost eight years earlier (see Wright, 2002; Wright and Fjellstrom, 2002 for detail discussion regarding BRT). In Jakarta, the first BRT corridor was essentially planned and implemented during the 9-month period from May 2003 until January 2004 (Ernst, 2005). A 12.9 km initial closed-system BRT corridor began operation on 15 January 2004, which started from Blok M bus terminal and ended at Kota Station (from north to south on the main road corridors). This system is operated by Bureau of Public Service (BLU) TransJakarta Busway.

In the first year of operation (2004), 15.9 million passengers traveled using this system (approximately 44,000 passengers per day or 3,600 persons/hour/two directions). The average load factor during the weekday and weekend was 91% and 75%, respectively. The highest load factor (up to 143%) was during the evening peak on weekdays (BP TransJakarta Busway, 2005).

Figure 1 provides the complete route of TransJakarta Busway which consists of 15 corridors. There are seven “colored” lanes, which each color represents specific corridor. The gray line represents the corridors that are being constructed, while the white line represents future corridor that has not being built. The newest corridor was opened at 21st February, 2009, i.e. the eighth corridor with a route from Lebak Bulus to Harmoni (29 km).

3. DATA COLLECTION

Data collection was completed from 12th up to 30th of April 2008 and took place in the 1st up to 7th corridor during peak and off-peak, i.e. morning, noon, and afternoon. The corridors were 1st corridor, Blok M – Kota; 2nd corridor, Pulo Gadung – Harmoni; 3rd corridor, Kali Deres – Harmoni; 4th corridor IV, Pulo Gadung – Dukuh Atas; 5th corridor, Kampung Melayu – Ancol; 6th corridor, Ragunan – Kuningan; and the 7th corridor, Kampung Rambutan – Kampung Melayu. The sample size was 455 respondents distributed evenly across the corridors. Respondents were selected randomly at the bus stop.

In this survey, researchers provided some incentive to the respondent of this survey, where the amount of “token of gratitude” was added to the cost of data collection. It is believed that the incentive should make the respondent to answer more carefuly and more reliable data could be obtained.

3.1 Questionnaire Design

In Indonesia, busway is the closest mode of transportation to subway or monorail. It is interesting to explore the BRT’s user preference when new kind of mode is available in the future. As the users consist of captive rider and choice rider from various economical states, they have high probability to change to better mode of transportation when the alternative is available or their welfare becomes improved. Hence, the Stated Preference method is appropriate to gather future preference of the respondent (subject of policy) regarding the hypothetical question.

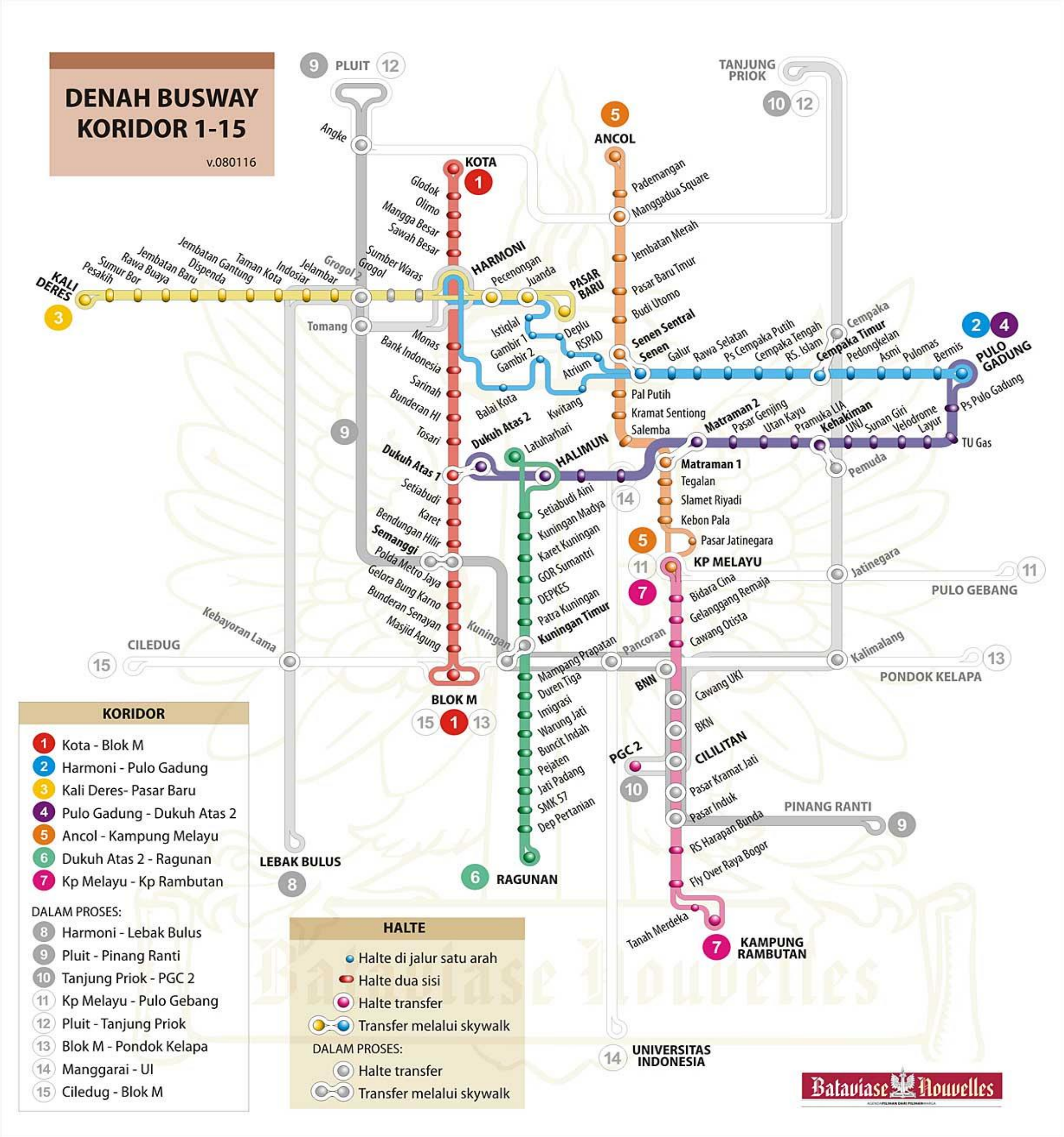

Figure 1 TransJakarta Routes (Bataviamap, 2007)

The hypothetical situation is reflected by providing the respondents with an imaginary 12.9 km corridor from Blok M to Kota. Although the trip is imaginary, the location is a real one. Figure 2 is a map of stated preferences condition. This route was chosen since it is believed that all of Jakarta's citizens surely know this place. In other words, Jakarta's citizen or even people from other part of Indonesia at least familiar with this particular location. Although the respondents were taken from seven corridors of BRT, the SP question was based on Blok M to Kota corridor. The respondents were asked to choose what kind of transport mode they would use if there were three operating types of mode on the selected route.

This research incorporates three modes, i.e. busway (BRT), monorail (LRT), and subway (MRT). Each mode has four attributes, namely fare, operating time, waiting time, and travel time, and three mode of transportation. Table 1 provides detail information of provided mode of transport.

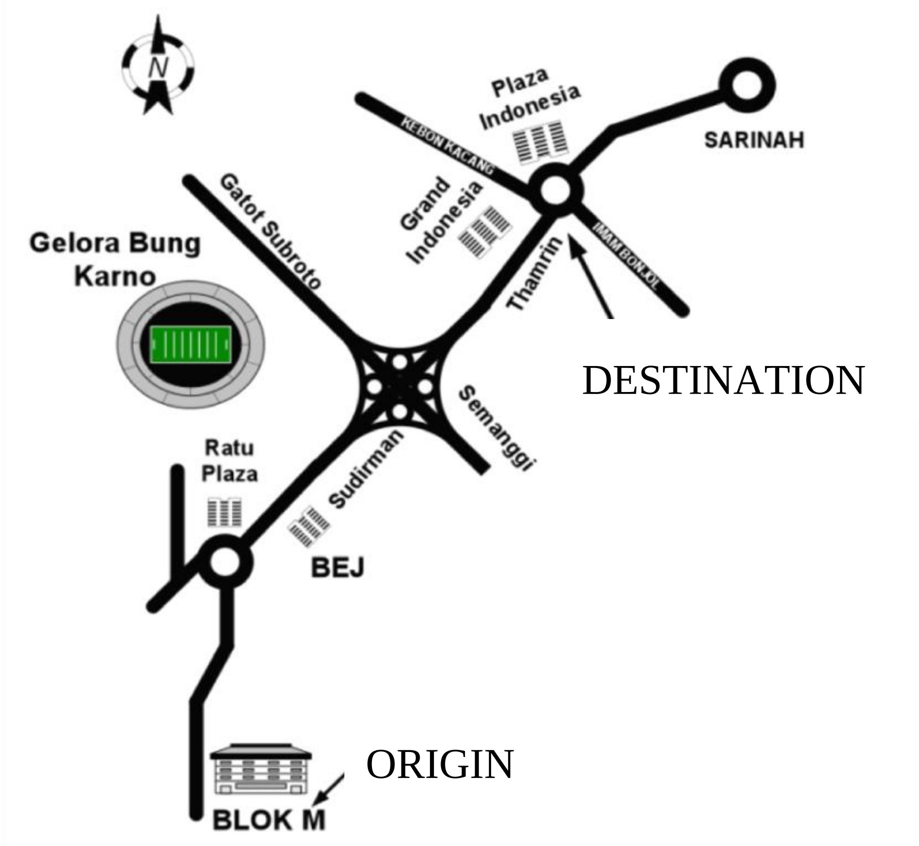

Figure 2 Illustration Map of Imaginary Trip

Table 1 Variation Values of Attributes

Attributes	BRT			Monorail (LRT)			Subway (MRT)		
	Alt. 1	Alt. 2	Alt. 3	Alt. 1	Alt. 2	Alt. 3	Alt. 1	Alt. 2	Alt. 3
Operational time	06.00-21.00	06.00-22.00	05.00-24.00	06.00-21.00	06.00-22.00	05.00-24.00	06.00-21.00	06.00-22.00	05.00-24.00
Ticket price (IDR)	3500	6000	8000	5000	10000	15000	9000	13500	18000
Headway (min.)	2	3.5	5	2	3.5	5	3.5	5	7
Travel time (min.)	6	9	12	5	7	12	5	6	7

Researchers designed the choices, attributes, and values (as appears in Table 1) by intensive reading and browsing from the most reliable sources available at the time of conducted research. The base line to valuing each variable was distance. The route covered Blok M terminal up to Bundaran Grand Indonesia with total distance around 7 km. This distance was used as the basis to determine the fare and travel time. Riding time was calculated based on average speed of certain mode, while fare was provided by referring to actual prices and design fare of certain mode. Most of the fare were distance based pricing. Since TransJakarta used fixed prices, distance has no effect on busway prices. Meanwhile, distance was an important base to determine waiting time and riding time. After the list of alternatives had been identified, levels of each attributes for those alternatives can be determined. Although each alternative may incorporate a mix of common as well as different attributes and even if two alternatives have similar attributes, the levels of those attributes may differ from alternative to alternative. In this research, three levels of attributes were provided to simulate every aspect of variable, i.e. low, medium, and high.

The fare of TransJakarta, in the time of this study was performed, was IDR 3500 (as an aside, USD 1 was equal with IDR 9,300 at the time this research was conducted). On the other side, there was a scenario to increase the price up to IDR 10,000 as the amount when the operator, i.e. *Badan Layanan Umum* (BLU), starts to gain profit from the operation of TransJakarta Busway (Tempo, 2007). Considering the amount of money granted to the BLU by the Government of DKI Jakarta, thus TransJakarta's break-even point was around IDR 8,000. After obtaining the maximum and minimum amount of fare, the amount of medium fare was decided to be IDR 6,000. In the case of LRT fare, the amount was calculated from the price of similar mode in Kuala Lumpur with a range from IDR 5,000 up to IDR 15,000. Moreover, the fare of METRO was interpolated from the price of SMRT and Kuala Lumpur MRT, since the fare system on SMRT and KTMB was distance based. As an alternative, it was also possible to take the fare of London tube as a consideration, but it was argued that the fare as much as GBP 3 per ride was too high for the case of Jakarta. Hence, the London tube fare was not considered in this study.

Travel times for each mode were derived from the speed of each mode over the traveled distance (7 km). The maximum speeds were 85 km/h for METRO and LRT, and 70 km/h for BRT. The medium speeds were 70 km/h, 60 km/h, and 42 km/h for METRO, LRT, and BRT, respectively. The lower speeds were 60 km/h for METRO and 35 km/h for LRT&BRT. From those stated speed, travel time could be varied for long, medium, and short.

The headway for each mode was also derived from the value of TransJakarta and SMRT. This headway may vary during its operational time, caused by daily demand fluctuation. For efficiency purposes, the operator reduced the headway when it was peak hour and vice versa. TransJakarta operating time was selected as the base for the operational time of BRT. The operating time was modified further by extending and reducing. Current TransJakarta operating time was 06.00 up to 22.00 and it was selected as the middle level. The extension of operating time, to represent high level operating time, was started an hour earlier and finished two hours later (05.00 up to 24.00). The low operating time was started at the same time as the middle level, but it ended an hour earlier (06.00 up to 21.00).

3.2 Experimental Design

A method of experimental design was selected to choose the representative alternative and to maintain the randomness of the situation. The foundation for any SP experiment is an experimental design. An experiment defined in scientific terms involves the observation of the effect upon one variable, a response variable, given the manipulation of the levels of one or more other variables. The manipulation of the levels of the variables does not occur on a haphazard manner. When it turns to a specialized form of statistics to determine what manipulations to make and when to make them, thus it can be said that the manipulations occur by design. Hence the given name is "experimental design" (Hensher et al., 2005).

As the number of alternative becomes so many (three choices, four attributes, and three levels), then 531,441 possible treatment combinations are available (recall 3^{4x3}). It is burdensome (somewhat impossible) to show all possibilities to the respondent. Reducing the number of levels within the design will dramatically reduce the design size. Nevertheless this kind of reduction on design size also reduces the observation gained. One such strategy often employed is to utilize the attribute levels at the extremes only. It means that each attribute will have only two attribute levels, both at the two extremes of the attribute level range. Such design is known as end-point designs (as suggested in Louviere et al, 2000). In this case, using an end-point design reduces the number of treatment combinations to 4,096. End-point design is particularly useful if the analyst believes that linear relationships exist amongst the part-worth utilities or if the analyst is using the experiment as an exploratory tool.

Rather than uses 531,441 possible treatment combinations, it is possible for the analyst to use only a fraction of the treatment combinations. This study uses only a fraction of the total number of treatment combinations that is called fractional factorial designs. To choose which treatment combinations to use, the analyst may randomly select a number of treatment combinations from the total number of treatment combinations without replacement. However, random selection is likely to produce statistically inefficient or sub-optimal designs. Thus, a scientific method that may be used to select the optimal treatment combinations to use is required. This procedure incorporates a term called orthogonality. Orthogonality is a mathematical constraint requiring that all attributes be statistically independent of one another. As such, orthogonality implies zero correlations between attributes. An orthogonal design is therefore a design in which the columns of the design display zero correlations (note that the attributes themselves may be perceptually correlated but statistically independent).

Orthogonal array used is L_{27} orthogonal array. Orthogonal array for this study comprises of three levels of 12 attributes plus one column reserved for the block. Thus, orthogonal array method was applied to select the representative alternative (please refer to Freequality, 2008). After combining various attribute and applying orthogonal array, there are 27 sets of alternative combination. The set of alternative was blocked into nine blocks, where each block consists of three situations. Each block refers to one questionnaire, while each situation refers to scenario. It means each respondent faces one questionnaire with three trip scenarios or situations.

Blocking makes the analyst should insert one more column in the orthogonal array, this column is used to segment the design. That is, if this new attribute has three levels, then the design will be broken down into three different segments (blocks). Each block is then given to a different respondent. The result of which is that nine different decision makers are required to complete the full design. Assuming that the analyst has done as described above, then for the design with 27 treatment combinations, each decision maker would receive three out of 27 treatment combinations and there will be nine different questionnaires.

3.3 Questionnaire Distribution

It is difficult to determine the size of sample needed to run a research, because of one or more error variances, while sample size may not be the main issue that the real goal is to design a high-quality study (Lenth, 2001). Keeps the idea in mind, the sample size for this research was determined by referring Israel's works (1992) on sample determination. Given that the confidence level is 95% and number of passenger used BRT, the minimum sample size of 400 respondents was selected. To accomodate unanswered question or any other possible error, 455 respondents was selected in this study.

In administering the questionnaire, a standard operating procedures (SOP) was provided to each surveyor as well as the coordinator. This procedure acted as a guide to easily and correctly administer the questionnaire. The procedure was made by considering all possible aspect and stage of distributing questionnaire. As the guideline was regularly used and improved, it contained experience from the past. Meanwhile, the new SOP was also adjusted to be more appropriate with the new situation.

3.4 Data Description

Statistic regarding the respondent is provided in Table 2. The characteristics of the respondent are obtained from filled questionnaire.

Characteristics of the respondent are explained by expressing the mean and standard deviation. Available classification in the questionnaire is also provided in the table. By exploring its value, it can be understood the characteristics of the user or decision maker. The characteristics are also useful to develop model, especially when the SDC (socio-demographic characteristics) is incorporated in the model specification.

Table 2 Descriptive Statistics regarding the Respondent

Variable	Mean	Standard Deviation
Position in Family (1=Husband; 2=Wife; 3=Child)	2.56	0.937
Marital Status (1=Married; 2=Single)	1.66	0.480
Age (1= Less than 15 years old; 2=15-20 years; 3=21-35 years; 4= 36-40 years; 5=41-45 years; 6=46-50 years; 7=51-55 years; 8=more than 56 years old)	3.19	1.243
Sex (1=Male; 2= Female)	1.46	0.499
Education (1=Uneducated; 2=Elementary School; 3=Junior High School; 4=Senior High School; 5=Diploma; 6=Undergraduate; 7= Graduate)	4.62	1.141
Job (1=Student; 2=Private Sector Employee; 3=Goverment Officer/Public Sector Employee; 4=Self Employ; 5=Housewife ; 6=Retired; 7= Unemployed; 8=Other)	2.21	1.459
Driver License Ownership (1=No Driver License; 2= Type A; 3= Type B; 4= Type C; 5=More than one type)	2.29	1.509
Car Ownership (1=0 unit; 2= 1 unit; 3= 2 units; 4= 3 units or more)	1.69	0.734
Motorcycles Ownership (1=0 unit; 2= 1 unit; 3= 2 units; 4= 3 units or more)	1.84	0.843
Home Ownership (1=Owned; 2= Parent's; 3= Rented; 4=Other)	2.12	0.911
Monthly Income (1=Less than Rp 1.000.000,-; 2= Rp 1.000.000 – 2.500.000; 3= Rp 2.500.001 – 5.000.000; 4= Rp 5.000.001 – Rp10.000.000; 5= More than Rp 10.000.000)	1.93	0.925
Income Allocation for Transportation (1=Less than 10%; 2= 10% - 20%; 3= 21% - 30%; 4= 31% - 40%; 5= More Than 40%)	1.62	0.670

4. DATA ANALYSIS

4.1 Model Estimation

The estimated model seems to have a good fit as appears in Table 3. The estimate also shows significant variables in determining the choices, where all variables have signs as expected. This means that the model is able to explain a logical relationship.

Besides the constants, the waiting time and riding time have a negative sign to explain that people tend to choose mode of transport with lower time spent. It is also the case with fare. Higher time and fare is accepted as two variables which will reduce the utility of the mode. On the other hand, the operating time has positive sign. It has a meaning that people has a higher preference on mode of transport with longer operation time (late night or early in the morning).

The model also contains some social demographic characteristics (SDC). In this model, the variables of income and age are significant in the model. People with income between 2.5 up to 5 million IDR have a tendency to choose public transport, as well as people in middle age, i.e. between 36 up to 45 years old.

Table 3 Model Estimate

Variable	Coefficient	p-value
BRT Constant	3.30509465	0.0000
BRT Fare	-0.00027225	0.0000
BRT Waiting Time	-0.18889684	0.0006
BRT Riding Time	-0.06919380	0.0115
LRT Constant	2.38800626	0.0001
LRT Fare	-0.00021741	0.0000
LRT Riding Time	-0.11570646	0.0000
MRT Operating Time	0.56171693	0.0088
MRT Fare	-0.00021795	0.0000
Income (IDR 2,5 – 5 Million = 1; Others = 0)	-0.89884245	0.0002
Age (36-40 years old = 1; Others = 0)	0.68834408	0.0422
Age (41-45 years old = 1; Others = 0)	0.86446306	0.0629
Log likelihood function	-956.5151	
Log likelihood at zero	-1495.2113	
Chi-squared; df = 10	363.72866	
Prob [chi squared > value]	0.0000	
R-squared	0.36028	
Number of obs.	1389	

4.2 User Behavior

Furthermore, by corroborating the estimate, the pattern of user behavior in the imaginary situation can be revealed. In this article, three attributes (fare, waiting time, and riding time) are analyzed by simulating its change to find the probability of users in opting for BRT. Its behavioral pattern can be explained by showing the range of proportion and the range of attribute's value as well. The proportion reflects the possibility of people to continue making use of BRT or to change to other modes (LRT or MRT).

It can be revealed that if the price of BRT is increased up to around 10,000 IDR, less than a half of BRT's current users can be expected to keep on making use of BRT (see Figure 3). This finding is quite interesting, since there was a discussion to increase the fare up to 10,000 IDR. It will result a significant decrease of income for the operator. Thus, it is too much risk if the fare will be increased more than 10,000 IDR in the future, since there will be a lot of user who will move to other mode. The newest discussion is to increase the fare up to 5,000 IDR. Based on this model, the proportion of user who will stay in this mode is about 70%. It can be judged as reasonable, since the reduction is quite small (about 15%). As an aside, one USD was equal with about 9,300 IDR at the time this research was conducted.

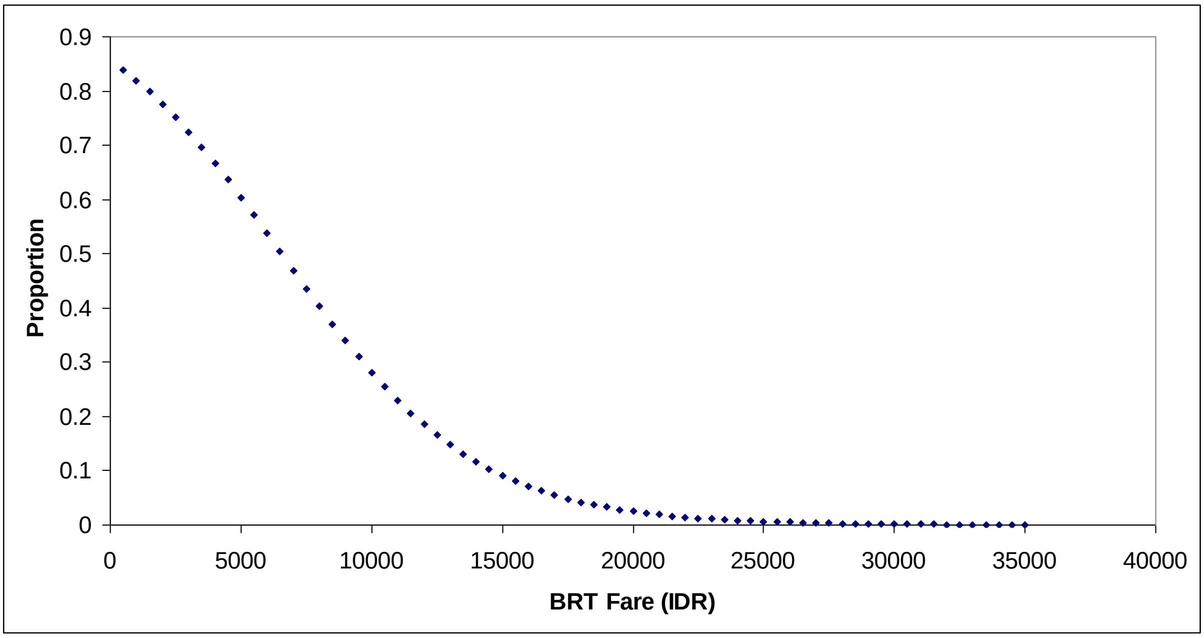

Figure 3 Relationship between BRT's Fare with Proportion who will Choose BRT

The influences of waiting time and riding time are presented in Figure 4 and Figure 5, respectively. It shows the different effect of waiting time and riding time to the proportion of BRT's users who will stay in making use of BRT. Waiting time seems to be much more sensitive than riding time. It can be inferred that passengers tend to pay more attention to waiting time than riding time. When the waiting time increases up to 15 minutes, around 15% of the respondents still prefer to use BRT. This fact is quite dangerous for the operation of public transit in Indonesian cities, since traffic condition is quite unpredictable. On the other hand, when the riding time is raised even up to 30 minutes, it can be hoped there is 20% of the current users will stay in making use of the mode. It can also be inferred, that current users have a higher preference to stay in the bus than waiting in stop or terminal.

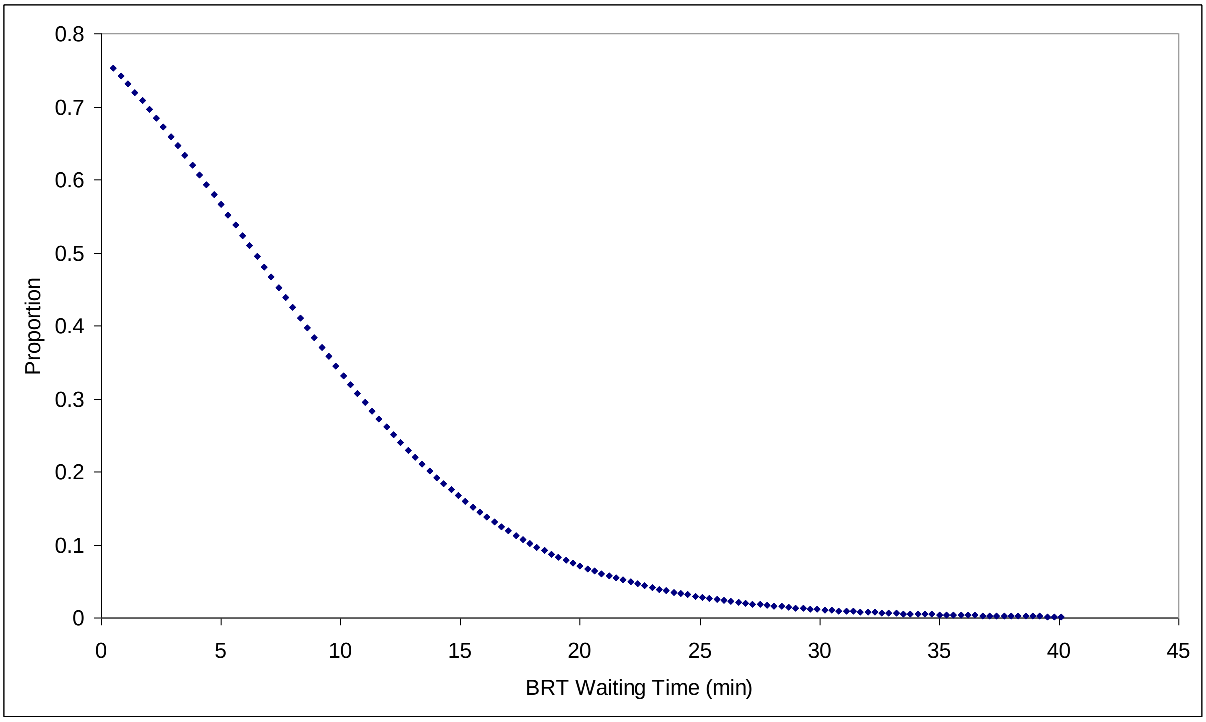

Figure 4 Relationship between BRT's Waiting Time with Proportion who will Choose BRT

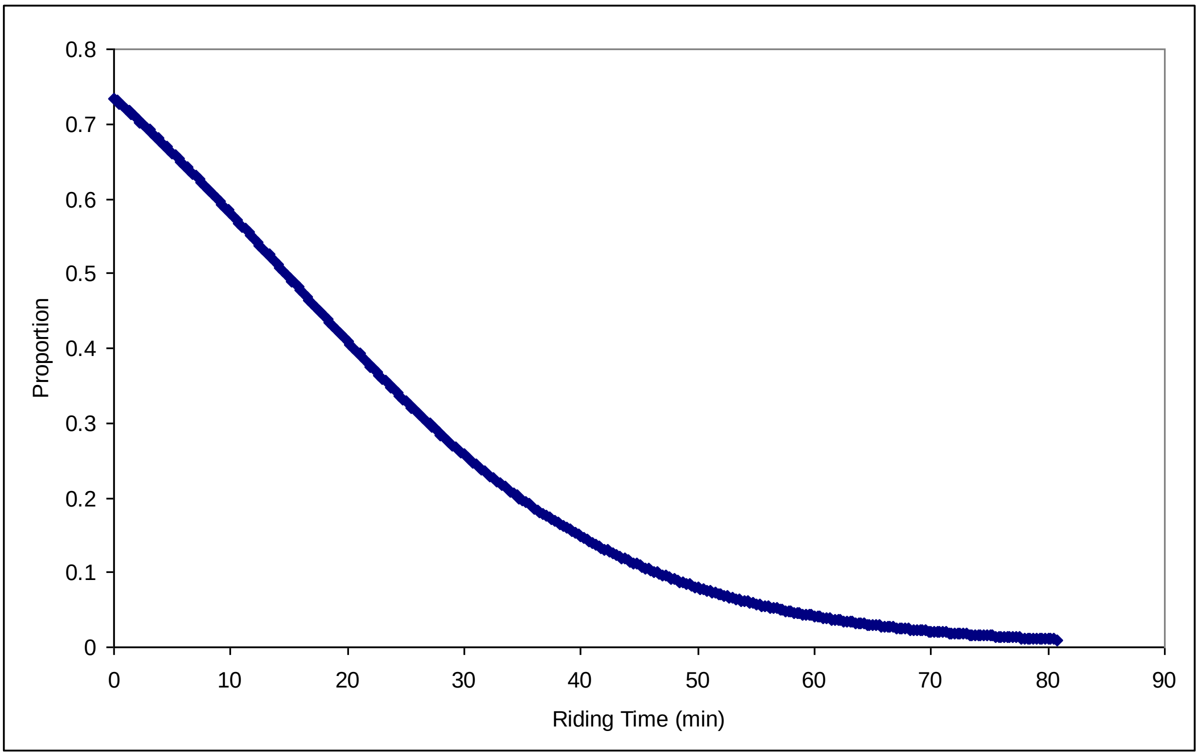

Figure 5 Relationship between BRT's Riding Time with Proportion of User who will Choose BRT

Figure 6 shows the effect of fare changes to the proportion of user who will keep using the BRT. The user has higher preference on BRT when there is a fare increment in LRT and

MRT. The fare of LRT looks as more sensitive than the fare of MRT. If the fare of MRT is increased up to more than 30,000 IDR, the percentage of people who will keep in BRT is quite similar (around 65%). It shows that people do not have an enough preference to MRT. On the other hand, if the fare of LRT is increased up to 15,000 IDR, it can be said that definitely people will move to BRT. It can also be inferred that people will have the same preference to all mode (BRT, LRT, or MRT), if the fare is about 5,000 IDR. The figure shows the potential user of BRT when the competitors change their fare. The competition between LRT and MRT seems quite hard, while BRT has quite safe user in the future.

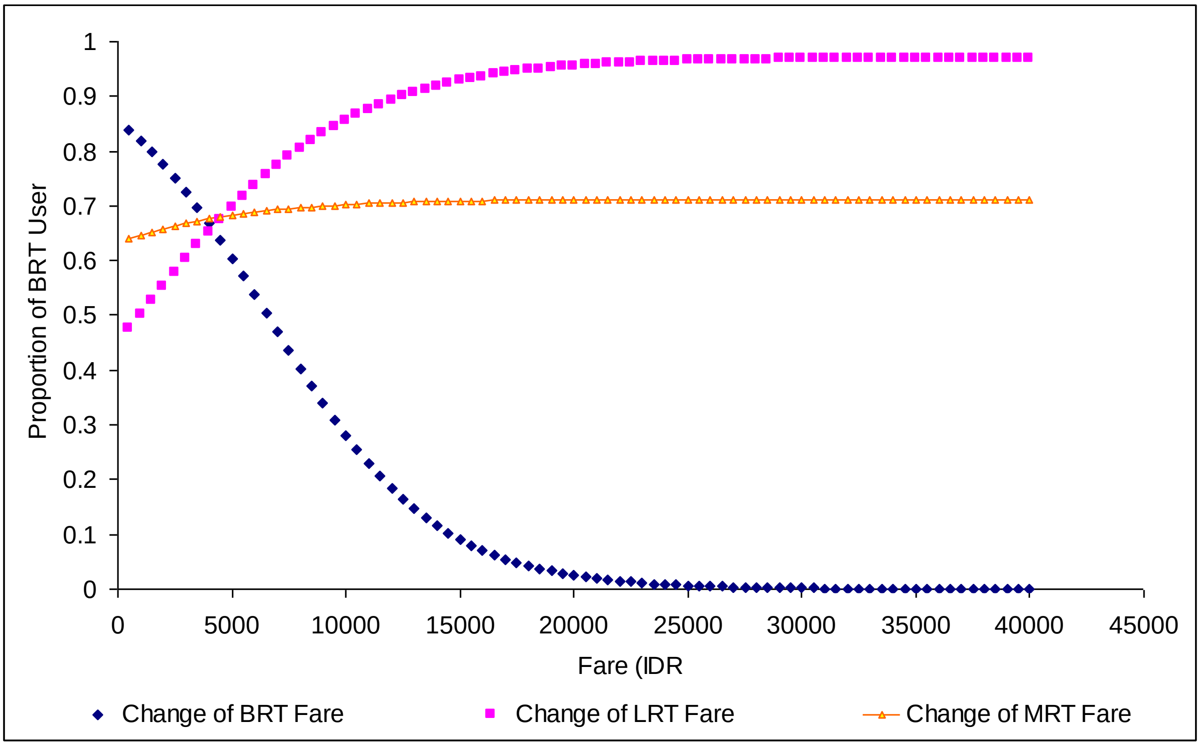

Figure 6 Relationship between Fares with Proportion of User who will Choose BRT

4.3 Discussion

In this model, there are several significant variable of the mode, namely fare, operating time, riding time, and waiting time. The variabel of fare, waiting time, and riding time are significant in explaining the preference on BRT, while only fare and riding time are significant in explaining LRT. Two variables are significant in explaining MRT, namely fare and operating time. The model also counts the effect of SDC variable, namely age and income. It explains that people in middle age and have middle income have preference in making use these kinds of mode.

All estimates in the model have signs as expected. All estimates have also very small p-value which expresses its significance. Some coefficient values are negative while other coefficients have positive sign. It is easily to understand that people are less preferable to use a mode when it has an expensive fare or longer waiting and riding time. On the contrary, the longer operating time the more preferable the user will be. The model clearly explains the preferences of the user.

It is also interesting to observe that both parts of travel time in BRT are significant, i.e. waiting time and riding time. Based on the model, people seem to put higher concern on waiting time than riding time. Furthermore, by relating the estimate of time with fare, it can be calculated the value of time to represent the willingness to pay. As the value is different, the model also able to explain two value of time with different reference, i.e. waiting and riding time.

As a matter of fact, the data set is also possible to be re-estimated in the future with other type of specification, e.g. by applying nested logit. The other benefit of the model composed in this study is its ability to help in forecasting travel demand, i.e. BRT, LRT, MRT.

The practical side of this analysis is its applicability for the operator of BRT. The operator should pay more attention to the reaction of the user with regard to keeping or increasing the utility obtained by the user. To maintain the sustainability of the mode in this fiercely competitive market, more attention devoted to the user is imperative.

5. CONCLUSIONS

This article corroborates in detail the application of stated preference technique, where the model estimation shows the ability of this technique in exploring the user preference in making choice of future transport mode. The process of development of questionnaire as well as administering the survey has been provided in detail in this piece of article. Detail explanations about the stated choices are also explained where BRT, LRT, and MRT are possible future mode of transport in Jakarta context. It means that the application of SP approach is useful in studying user behavior in making choice of the mode, as well as the future condition of mode sharing in Jakarta.

Multinomial logit model is developed in this research. The model is statistically fit which provides statistically strong evidence of the quality of the data. Moreover, model estimation provides a useful and depth insight of the preference of people choice.

The model estimate shows the user characteristics that could affect user choice, i.e. age and income. The model is not just able to be used for exploring the behavior in making choice or any other preference matters in mode choice of public transport. The model has also a capability to show the value of willingness to pay, as well as the reason of people in selecting mode choice.

This study shows a potential benefit in applying stated preference method and disaggregate model for Indonesian context, i.e. Jakarta. It is important to note that this approach relatively new in Indonesia, while the advantage is obvious as can be seen in this study. This study provides useful information regarding the future situation when new mode of transport will be implemented.

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