



Ability To Pay (ATP) and Willingness To Pay (WTP) Jakarta Mass Rapid Transit

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Abstract. The Jakarta MRT has been operating on the Lebak Bulus - Bundaran HI line with a total of 13 stations with the farthest trip fare of the Jakarta MRT at Rp14,000. Currently, an extension of the Jakarta MRT route across Bundaran HI - Kota is being carried out by adding 8 stations which will be directly integrated with TransJakarta bus stops. With the construction of phase 2A of the Jakarta MRT, it is necessary to review tariff determination using Ability To Pay (ATP) and Willingness To Pay (WTP). This study aims to identify the characteristics of potential passengers of MRT Jakarta phase 2A, as well as to analyze the amount of Ability To Pay (ATP) and Willingness to Pay (WTP) of MRT Jakarta phase 2A. This analysis was conducted on 400 Jakarta MRT phase 1 users and TransJakarta users at bus stops around the planned location of the Jakarta MRT Station phase 2A. The ATP analysis used an individual travel cost approach and obtained a result of Rp17,044. While determining the WTP value using a cumulative frequency distribution approach and obtained a WTP value of IDR 19,000. The Ability to Pay (ATP) value is smaller than the Willingness to Pay (WTP) which indicates that MRT users are referred to as captive riders.

Keywords: Ability To Pay, Willingness To Pay, Travel Cost Individual, Frequency Distribution

1 Introduction

One of the strategies for the development and development of a rail-based urban mass transit system that connects the Jabodetabek area, are the construction of the Jakarta MRT North-South Corridor and West-East Corridor (1). In accordance with the Presidential Regulation of the Republic of Indonesia number 56 of 2018, it is stated that one of the lists of national strategic projects for the construction of inner-city railway infrastructure and facilities is the Jakarta MRT North-South Corridor (2).

The currently operating Jakarta MRT (phase 1) is operated with tariff provisions that refer to DKI Jakarta Governor Regulation Number 34 of 2019. The minimum fare for the Jakarta MRT transportation is IDR 3,000.00 and the fare for the longest distance of rail transportation in the city of MRT in the Lebak Bulus – Bundaran Hotel Indonesia corridor is IDR 14,000.00 (3). Tariffs are an important factor in the field of transportation services. Tariffs are set to ensure the continuity of transportation operations according to predetermined standards. Tariff determination can be viewed from the aspects of Ability To Pay (ATP) and Willingness To Pay (WTP) (4).

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A. Pradipta et al. (eds.), *Proceedings of the 2nd International Conference on Railway and Transportation 2023 (ICORT 2023)*, Advances in Engineering Research 231,
https://doi.org/10.2991/978-94-6463-384-9_30

2 Method

The data collection process was carried out by means of a survey using a questionnaire. The survey was conducted at the Jakarta MRT Station and bus stops around the prospective location of phase 2A Jakarta MRT Station.

2.1 Population and Sample

Population. In this study, the population used is the number of residents who live in South Jakarta, Central Jakarta, and West Jakarta. Population is a generalization area consisting of objects / subjects that have certain quantities and characteristics set by researchers to study and then draw conclusions (5). It is not possible to conduct research on the entire population, so it is necessary to determine the number of samples that can represent the entire population to facilitate data collection in this study.

Table 1. Total Population

Area	Total Population (2022)
West Jakarta	2.448.975
Central Jakarta	1.079.995
South Jakarta	2.244.623
Total	5.773.593

Sample. The definition of a sample is a part of the number of characteristics that the population has (5). In this study, to simplify data collection in the study, the number of samples was determined using the Slovin method.

$$\begin{aligned}
 \text{Sample} &= \frac{\text{population}}{1 + \text{population} \times (\text{error})^2} \\
 &= \frac{5.773.593}{1 + 5.773.593 \times (0,05)^2} \\
 &= 399,9919026 \\
 &= 400 \text{ sample}
 \end{aligned}
 \tag{1}$$

2.2 Survey

A survey was conducted to 400 respondents conducted at the Jakarta MRT Station and bus stops around the prospective location of the Jakarta MRT Station phase 2A. The data obtained are data on respondent characteristics, ATP data, and WTP data. ATP data include amount of income, travel cost, and travel frequency. Respondent characteristics include age, gender, occupation, reasons for using the Jakarta MRT, and trip purpose (6).

The instrument was tested for validity using the concept of content validity (CVR) which was developed by Lawshe as cited by Hendrayadi (7). There are three rating scales for each question item, namely [1] clear, [2] less clear, and [3] unclear. If half of

the subject matter experts (SME) indicate that a particular item is clear, then the item has a sufficient level of validity (7). CVR is calculated with this following formula.

$$CVR = \frac{n_e - \frac{N}{2}}{\frac{N}{2}}$$

[2]

CVR = Content validity ratio

ne = The number of raters (SME) who answered "clear"

N = Total number of SME

3 RESULT

Based on the analysis that has been carried out, the research results regarding ability to pay and willingness to pay are obtained as follows.

3.1 Characteristics

The characteristics of respondents obtained from the questionnaire survey results include age, gender, occupation, reasons for using the Jakarta MRT, and trip purpose.

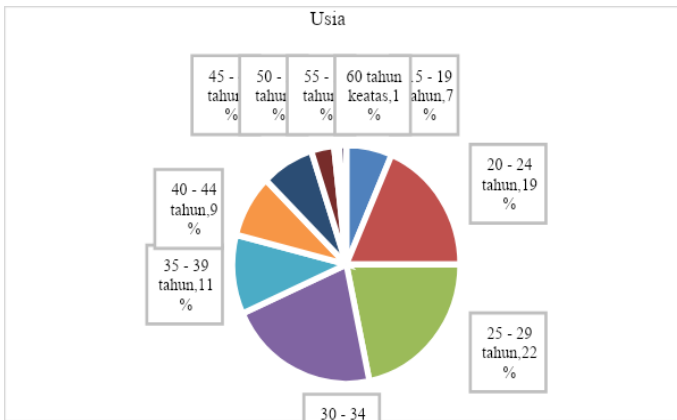


Fig. 1. Age

The largest percentage of the age of potential users of the 2A phase of the Jakarta MRT is 21.75% aged 25-29 years.

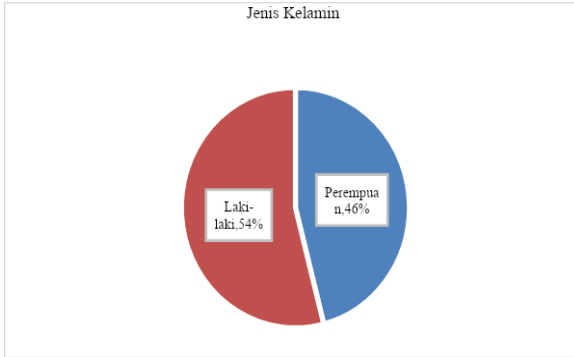


Fig. 2. Gender

While the gender ratio of male and female passengers is 54%: 46%.

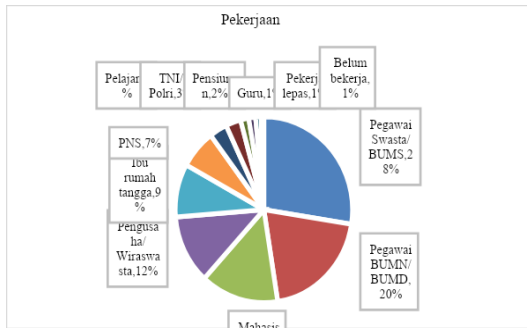


Fig. 3. Occupation

As many as 27.5% of prospective passengers of the Jakarta MRT work as Private / BUMS employees.

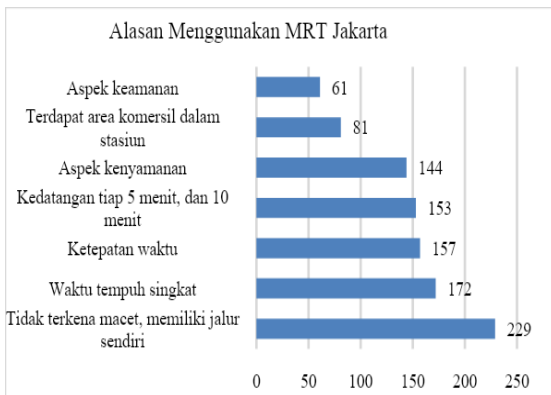


Fig. 4. Reason of using the Jakarta MRT

Prospective users of the Jakarta MRT phase 2A are interested in using the Jakarta MRT because the MRT is not affected by traffic jams.

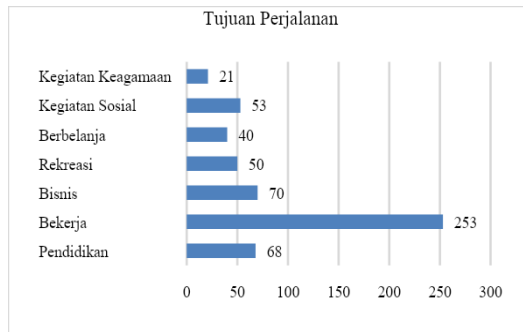


Fig. 5. Trip Purpose

A total of 253 respondents travels daily for work, while 21 respondents travel for religious activities.

3.2 Ability To Pay (ATP)

Ability To Pay (ATP) is a level of ability of a consumer/service user to pay for the services he/she receives based on the ideal income of a consumer/service user. From the survey results, those are data including: amount of income, transportation costs, and travel frequency which are then calculated to determine the ATP value. The value of the Ability To Pay (ATP) amount is calculated using travel cost individual (4), with the following formula:

$$ATP_{\text{individual}} = \frac{Ic \times \%TC}{D}$$

[3]

- Ic = amount of income
- % TC = percentage of travel costs from total income
- D = travel frequency

With a total sample of 400, the individual ATP value of each sample is obtained (see Table 2).

Table 2. Ability To Pay (ATP) Calculation

No	ATP	Total	Percentage
1	Rp7.053 - Rp13.713	130	33%
2	Rp13.714 - Rp20.374	164	41%
3	Rp20.375 - Rp27.035	43	11%
4	Rp27.036 - Rp33.696	24	6%
5	Rp33.697 - Rp40.357	14	4%

No	ATP	Total	Percentage
6	Rp40.358 - Rp47.018	15	4%
7	Rp47.019 - Rp53.679	2	1%
8	Rp53.680 - Rp60.340	3	1%
9	Rp60.341 - Rp67.001	0	0%
10	Rp67.002 - Rp73.662	5	1%

Therefore, a cumulative frequency distribution graph can be formed ATP (see Fig. 6).

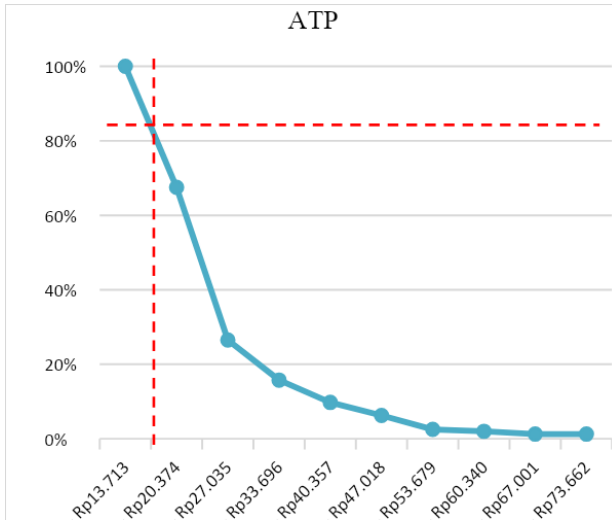


Fig. 6. Ability To Pay (ATP)

Using a cumulative frequency distribution of 85% (8), the ATP value of prospective passengers of MRT Jakarta phase 2A is in the range of Rp13,714 - Rp20,374. The median of the data range is Rp17,044.

3.3 Willingness To Pay (WTP)

Willingness To Pay (WTP) is the highest cost that a consumer/service user is willing to pay to obtain a benefit in the form of goods or services to be obtained (9). In economics, the Willingness To Pay (WTP) value of consumers is the maximum amount of costs that are willing to spend to use a service, rather than not using the service (4).

The calculation of the Willingness To Pay (WTP) value of potential passengers of the Jakarta MRT phase 2A uses the farthest distance approach with in order to make it easier for further calculations because the Jakarta MRT phase 2A is an extension of the route of the Jakarta MRT phase 1. Considering the current operational conditions of the Jakarta MRT, prospective passengers of the 2A phase of the Jakarta MRT have different willingness to pay the Jakarta MRT fare for phase 2A.

Table 3. Willingness To Pay (WTP)

No	WTP	Total	Percentage
1	Rp15.000	8	2%
2	Rp16.000	2	1%
3	Rp17.000	29	7%
4	Rp18.000	25	6%
5	Rp19.000	35	9%
6	Rp20.000	109	27%
7	Rp21.000	89	22%
8	Rp22.000	85	21%
9	Rp23.000	14	4%
10	Rp24.000	4	1%

Therefore, a cumulative frequency distribution graph of WTP can be formed (see Fig. 7).

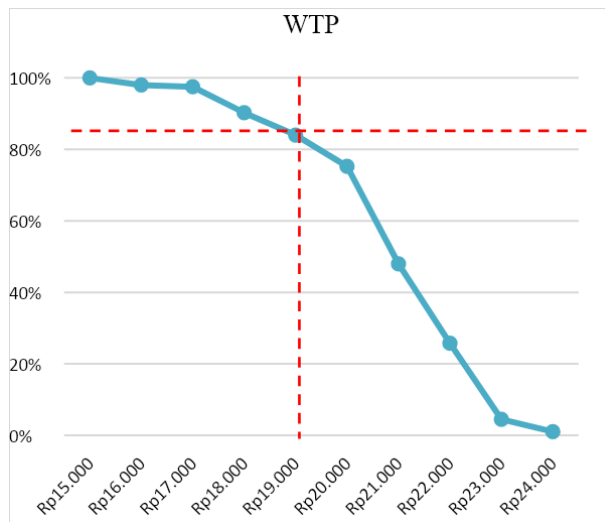


Fig. 7. Willingness To Pay (WTP)

% Based on the cumulative frequency distribution of 85% (8), the WTP value of prospective passengers of the 2A phase of the Jakarta MRT is Rp19,000.

3.4 The Relation Between ATP and WTP

After determining the amount of ability to pay and willingness to pay the Jakarta MRT fare, the relationship between ATP and WTP can be determined. Determination of the relationship between ATP and WTP is divided into three (10), which are:

1. $ATP > WTP$. Conditions that indicate that the ability to pay for respondents is greater than the willingness to pay for these services. This happens because the utility of transportation is low. In this condition users are called choice riders.

2. $\text{ATP} < \text{WTP}$. In this condition, the user's willingness to pay for the service is greater than the economic ability to pay. This may occur if the user has a low income but high utility for the transportation, so that the user's willingness to pay for the service tends to be more influenced by utility. In this condition users are called captive riders.
3. $\text{ATP} = \text{WTP}$. This condition indicates that there is a balance between the ability to pay and the willingness to pay for transportation services. In this condition there is a balance of user utility with the costs incurred to pay for these services.

Based on the results of the calculation of ATP and WTP of the Jakarta MRT phase 2A, it is known that the relationship between ATP and WTP is the relationship between $\text{ATP} < \text{WTP}$. Where the users of the 2A phase of the Jakarta MRT are referred to as captive riders. This is possible for users who have relatively low income, but the utility of the service is very high, so that the user's willingness to pay for the service tends to be more influenced by utility.

4 Conclusion

1. The characteristics of prospective passengers of the Jakarta MRT phase 2A show that the age of most respondents in the range of 25-29 years as much as 21.75% with men being the most respondents. Prospective passengers work as Private Employees / BUMS and BUMN / BUMD Employees as much as 27.5% and 20%. Jakarta MRT was chosen because it is not affected by traffic jams. The purpose of traveling is to work.
2. Based on the results of the analysis, the ATP value is Rp17,044 and the WTP value is Rp19,000. Then the value of $\text{ATP} < \text{WTP}$. This is possible for users who have relatively low income, but the utility of these services is very high, in this condition users are called captive riders.

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