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Analysis of Willingness to Pay (WTP) to Determine Road Pricing in Jakarta

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Abstract

Traffic jam that occurs in Jakarta causes reduced income and lower economic benefits for workers who work in the Sudirman area. Total economic loss due to the congestion on Jl. Sudirman is Rp 19,716,239,573,128 / year, or about 1.6 percent of Jakarta GDP. Based on the study results, the ideal price of ERP for one entrance is Rp 24,200. If the ticket price is assumed to be Rp 24,200 and the number of vehicles passing on Sudirman and Thamrin Roads every day is as much as 40% of the number of motor vehicles (4,890,906 units), or 1,956,362 units of vehicles per day, the revenue of the city government will increase to Rp. 14,203,191,024 per year with the ERP implementation.

Keywords: Willingness, Pay, Pricing

1. Introduction

Congestion in Jakarta especially in the past 10 years has been of greater concern. Some major causes are the high rate of private vehicles, imbalanced growth of roads with the growth rate of vehicles and lack of road discipline. According to [8], building new roads or increased the capacity of the existing roads is one way to reduce congestion, which is generally costly. Further, an increased road capacity is a strong demand as this will save travel time. Many agree that the region cannot continue to build roads to get out of the traffic jams, so the demand management is the key.

Some policies have been made by Jakarta government in dealing with the traffic breaking jams such as restrictions on motor vehicles with the implementation of electronic road pricing (ERP), the construction of the Mass Rapid Transit (MRT), and the construction of two non-toll highways (JLNT) of Kampung Melayu-Tanah Abang and Antasari-Blok M. The Electronic Road Pricing (ERP) was in fact applied on Thursday, February 2nd, 2010.

Transportation services of jakarta Province has calculated the route cost of Rp. 12,500 for one traffic on Blok M to Kota Station, Jalan Gatot Subroto (from Kuningan to Senayan), R Rasuna Said to Tendean, Tendean to Blok M and Asia Africa to Pejompongan. The calculation of the ERP rates is based on the efficiency in vehicle operating cost, *jockey* (passenger lifting) cost for the 3-in-1 areas, Urban Toll rates, survey results and the ERP of other countries. However, a more in-depth assessment is required of whether the price already set up is effective in reducing the number of vehicles such as cars because in practice of the three-in-one policy, the riders still have the ability to pay a jockey (three-in-one) at Rp 20,000. It is necessary to determine to what extent the public will turn to mass transport with the ERP cost of Rp.12.500.

Congestion has a negative impact on human life. The magnitude of the negative impact can be felt partially in the increased costs, and indirectly such as respiratory diseases. Based on the calculation of the loss components suffered by the public, the following results are obtained as can be seen in Table 1.

The total economic loss as a result of traffic jams on Jl. Jenderal Sudirman is Rp. 19,716,239,573,128/year. The loss will be much greater if the multiplayer effect is included from the existing losses.

With the background presented above, the following are the objectives of this study:

1. To determine the decrease in the number of vehicles when the road pricing is applied on Jalan Sudirman.
2. To examine the effectiveness of road pricing in reducing the number of motor vehicles on the road.

2. Research Method

2.1 Research Object

The objects of this study are those who drive their own vehicles. Therefore, the study mainly used the interview technique in collecting data and to a lesser extent an emission measurement tool.

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2.2 Place and Time of Research

This study took place in the Province of Jakarta, covering the area of Blok M-Kota Station, Jalan Gatot Subroto (from Brass-Senayan), Rasuna Said-Tendean, Tendean-Blok M and Asia Africa-Pejompongan. The study started in 2013 for a period of eight (8) months for all research activities. These include an assessment of the research scope, field surveys and data entry, data processing activities, FGD, draft report, final reports, and publication for international journals.

2.3 Data Processing and Analysis

Analysis Of Road Pricing Effectiveness In Reducing the Number Of Motor Vehicles On the Road. Analyzing the road pricing that is already set up by comparing with the public capability. The public ability is examined based on analysis on their willingness to pay (WTP).

Analysis Of the Reduced Number Of Vehicles When Road Pricing Is Applied On Jalan Sudirman. The calculated reduction in the number of vehicles is based on the results of interviews with respondents. The percentage of respondents switching from a personal transportation mode to public transportation can be obtained from the interviews, which can indicate the decrease in the number of vehicles on the road. However, the decrease in the number of vehicles will also be based on the vehicle arrivals in the area.

3. Research Result

3.1 Increased Use of Fuel

The daily traffic jams on Jalan Sudirman greatly affect workers, especially resulting in the material loss in the form of money and time. One of the material losses caused by congestion is the purchase of fuel. The longer the travel time spent, the more fuel is needed. Comparing the increased use of fuel by respondents with that of normal circumstances, as many as 158 respondents in the normal condition spent 0 to 2 liters of fuel to go to the workplace, but during congestion they decreased in number by 7 to 8. This is because there is an increase in fuel use of as much as 3 to 6 liters and 7 to 8 liters when congestion occurs.

3.2 Analyis of Reduced Number of Vehicles when Road Pricing is Applied on Jalan Sudirman and MH Thamrin

Initially the Jakarta Provincial Government set the ERP cost per trip at Rp.12,500. However, this is considered to be ineffective in reducing congestion on Sudirman and Thamrin Roads. That is because the calculated cost is based on the return of investment, and the public still can afford the cost. In order to reduce the number of vehicles circulating on these roads, the cost should be adjusted to the who cannot afford become the responsibility for local governments to prepare a comfortable, cheap, fast, and secure mode of transportation.

Table 1
Total Value of Losses due to Traffic Jam

No	Economic Loss	Loss Value per Year (Rp)
1	Fuel Inefficiency	15.008.423.787.414
2	Reduced Productivity of Workers	2.871.644.285.714
3	Stress	525.800.000.000
4	Health	1.310.371.500.000
TOTAL ECONOMIC LOSS		19.716.239.573.128

Source: Yusman et al, 2013

Table 2
Average Rates of Public Wllingness to Pay ERP

NO	WTP CATEGORIES	WTP AVERAGES	FREQUENCY	RELATIVE FREQUENCY	TOTAL
1	>10000-15000	12500	31	0,21	2583
2	> 15000-20000	17500	32	0,21	3733
4	>20000- 25000	22500	27	0,18	4050
5	>25000-30000	27500	20	0,13	3667
6	>30000-35000	32500	15	0,10	3250
7	>35000-40000	37500	10	0,07	2500
8	>40000-45000	42500	10	0,07	2833
9	>45000-50000	47500	5	0,03	1583
TOTAL			150	1,00	24200

Source: Adapted

ERP cost is calculated on the basis of the Willingness to Pay (WTP), indicating average values of public ability to pay ERP. This WTP calculation is done through the interviews with 150 respondents randomly selected from those who are the owners of the cars or transporting vehicles. From the interview, the following rates of public ability to pay ERP are obtained as shown in Table 2:

The resulted calculation showed that the average value that the public is able to pay ERP is Rp.24,200. Thus, ideally ERP for one entry is Rp.24,200. If the ticket price is assumed to be Rp.24,200 and the number of vehicles passing on Sudirman and Thamrin is 40% of the number of vehicles (4,890,906 units of motor vehicles) or 1,956,362 units of vehicles per day, then the Jakarta government revenue will be Rp. 47,343,970,080 per day. If we assume the active working days each year is 300 days, then the total revenue in one year will be Rp. 14,203,191,024,000/year.

With this amount of funds, Jakarta Government can build a good mode of transportation, and prepare a quality transportation system in accordance with the public expectations: a convenient, inexpensive, fast, and secure transportation.

4. Conclusion

Based on the analysis, ideally ERP for one trip is Rp.24,200, if the ticket price is assumed to be Rp.24.200 and the number of vehicles traveling on Sudirman and Thamrin is 40% of the total number of vehicles (4,890,906 units of motor vehicles) or 1,956,362 units of vehicles per day.

Based on the previous data as indicated in Point 1, the Government of DKI will receive Rp. 47,343,970,080 per day. If it is assumed that the active working days are 300 days, then the total revenue is Rp. 14,203,191,024,000 / year.

5. Recommendation

Jakarta Provincial Government should increase its ERP rate, from Rp 12,000 to Rp 24,200. If this is applied, it will decrease the number (as many as 4,890,906 units of motor vehicles) passing through Jl. Sudirman and MH. Thamrin by 40% or 1,956,362 units of vehicles per day. In addition, it will have a positive impact on the environment; because of the decrease in the number of vehicles passing in this region, the reduction of gas emissions will occur.

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