Sustainable Transportation Strategy in Semarang City, Indonesia

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Abstract:

The aim of this research is to find out the general description of Trans Semarang BRT condition and also the Semarang city people's preference in the transport service of Trans Semarang BRT. Evaluating people's interest later will be a basis in formulating the strategy of sustainable public transport. This research uses the descriptive quantitative approach and tends to use the inductive approach analysis and the SWOT analysis. The data used is the primary and secondary data by using the purposive sample technique. The result of research found that the level of people's satisfaction in the transport service provided by Trans Semarang BRT is in good enough level. It indicates that people's interest in BRT of Semarang city is high enough. However, the complaint on the public transport facility provision is also still high. Whereas the strategy to conduct for the improvement is increasing the quality of public transports by repairing the shelters of Trans Semarang BRT, increasing the number of fleets, repairing the operational system, increasing the integration, holding a special lane, decreasing the price discrimination, increasing the facilities, holding trainings for the officers, and increasing the safety.

Keywords: *Sustainable Transportation, Strategy, Trans Semarang, Preference.*

I. Introduction

Semarang city is the capital of Central Java that has great enough activities. The economy activities in Semarang city keep increasing because it is located in a strategy place, which is in the middle of Java Island and becomes the main line of people's mobility in Java Island. It is indicated by the amount of private vehicles that keep increasing year by year.

In any economy transport infrastructure act like a baseline to ensure continues smooth flow of movability of public and goods as input and output from all economic sectors. There is a need therefore to maintain and improve the existing transportation and build new infrastructures for a national wealth (Jain, 2017). The greater the economy activities will increase either people's or goods' mobility. Public transport can be used to promote in some urban areas where it is considered as one of the significant measures for solving economic, social and environmental issues in transport sector (Muromachi, et.al. 2015). Shabani (2018) stated improved transport infrastructure facilitates the

migration of labour from underdeveloped to developed areas through agglomeration effects, thereby causing negative spillover effects. Therefore, the spillover effects of transportation infrastructure on a region's economic growth depend on diffusion and agglomeration effects. The increase in the number of people and its mobility that is not in balance with the adequate infrastructure will raise a problem in transports. One of the problems in transports is traffic jams, which will make inefficiency in the economy. Traffic jams will bring several bad impacts such as the insufficiency in the flow of goods, the inefficiency of time for the workers, the increasing number of accidence, the waste of fuel, the air pollution, etc.

In the Act No.22 of 2009 on the Highway Transport Traffic, specifically article 158, it is mentioned that the government guarantees the availability of road-based mass transports to meet people's transport need with public transports in rural area. The mass transports are aimed at reducing the road traffic. If it is accompanied by the good policy, the mass transport system will absorb the private vehicle users who will move to use the mass transports.

In Semarang city there have been various types of mass transports, such as bus or public transports. As a part of efforts to solve the traffic-jam problem, the Central Government through the Department of Transportation has proposed the program of Rapid Transit Bus (BRT).

Now people in Semarang city requires more efficient public transport because the previous ones have not been able to solve the traffic-jam problem and the high pollution in Semarang City. Therefore, it requires a research to find out the transport problems and to evaluate the performance.

Rapid Transit Bus (BRT) is one of public transports that provides faster and more efficient service compared with other public transports. Trans Semarang BRT has started to operate in October 2010. It is the program of the Government of Semarang city in cooperation with PT Trans Semarang.

The program of BRT is expected to be in accordance with the initial purpose, which is to attract people's attention to move from using their private vehicles to use the BRT transport service so that the traffic jams will be overcome. The concept of BRT itself is a mass transport system integrated in every corridor, which aims at meeting people's need on transportation within the city. Therefore, it requires a strategy of optimizing BRT to be sustainable public transport, one of which is by analyzing people's attention in Semarang city on Rapid Transit Bus (BRT).

II. METHOD

The data used is primary and secondary data. The primary data is taken based on the interview with the officers of Trans Semarang BRT, the questionnaire to the passengers of Trans Semarang BRT, and the observation through direct observing and recording to the object of research. The secondary data is used from the literatures, newspapers, and the government's data related to the problem of research.

The population of research is all the passengers of Trans Semarang Rapid Transit Bus (BRT). And the sampling method taken in this research covers Non Probability Sampling, Haphazard Sampling, and Purposive Sampling. The determination of sample measure uses the approach in accordance with the Yamane Approach (1973). The population of research (N) = 21917, d = 20%, so the number of samples (n) is 249.715 and rounded to 250. The analysis data used to process the data is the statistic descriptive and the SWOT analysis.

III. RESULT AND DISCUSSION

The survey of people's interest in Trans Semarang BRT analyzes 25 questions representing five factors as the parameter of people's interest and satisfaction (as costumers/consumers) those are

Tangibility, Reliability, Responsiveness, Assurance, and Empathy. From such various indicators, the result of research finds several things as follows:

1. Tangibility indicator covers the cleanliness and view of the bus shelters, the view of the bus shelter officers, the view of the officers in the bus, the facility equipment in the bus shelter and in the bus. All the items of questions on the tangibility indicator show that most of the BRT passengers are satisfied with the service provided by BRT.

2. Reliability indicator covers the accuracy of bus departure, the facility available in the bus shelter, the facility equipment in the bus, the convenience and comfort to reach the bus shelter, and the officer's conformity in lowering and raising the passengers. All the items of questions on the reliability indicator show that most of the BRT passengers are satisfied with the reliability of BRT service.

3. Responsiveness indicator covers the officer's skillfulness in assisting the passengers to get information, in setting the queue of passengers, in keeping the cleanliness and comfort in the bus shelter. All the items of questions on the responsiveness show some responses as follows: 108 passengers are satisfied, 78 passengers are neutral, and 33 passengers are not satisfied with the officer's responsiveness.

4. Assurance indicator covers the skill of the bus shelter officer, the service of the bus shelter officer in keeping the safety and discipline in the bus shelter, the skill of the bus driver, the skill of the bus officer, the kindness and honesty of the bus shelter officer and the bus officer. All the items of questions on the assurance show that most of the BRT passengers are satisfied with the assurance provided by the BRT.

5. Empathy indicator covers the officer's kindness in welcoming the passengers, the officer's saying thank you to the passengers, his well treating to the passengers. All the items of questions on the empathy show that the BRT passengers are neutral to the empathy provided by the BRT officers.

6. The whole satisfaction of the consumers covers the passengers' satisfaction when using BRT, their satisfaction with the BRT service, their satisfaction with the BRT officer's service. All the items of questions on the consumers' satisfaction as a whole show that the BRT passengers are satisfied with BRT as a whole.

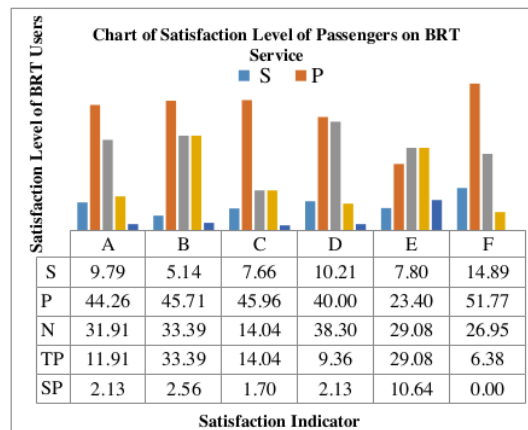|	A	B	C	D	E	F
Chart of Satisfaction Level of Passengers on BRT Service ■ S ■ P						
S	9.79	5.14	7.66	10.21	7.80	14.89
P	44.26	45.71	45.96	40.00	23.40	51.77
N	31.91	33.39	14.04	38.30	29.08	26.95
TP	11.91	33.39	14.04	9.36	29.08	6.38
SP	2.13	2.56	1.70	2.13	10.64	0.00

Figure 1. Chart of Satisfaction of BRT Service

Based on the above chart, it can be seen that most passengers are satisfied with each indicator. The highest level of satisfaction is on indicator C (Responsiveness) amounted 108 points. The highest level of dissatisfaction is on indicator E (Empathy) amounted 41 points. Therefore, it requires an improvement in the quality of Human Resource Development or the service related to empathy so that people's interest in BRT will be increasing.

Based on people's assessment on BRT transport's service, it requires a strategy to improve the service to be more efficient. Some strategies required for the planning of BRT Trans Semarang to be the sustainable public transports based on the result of SWOT analysis are as follows:

Strength	Weakness
1. The cleanliness of BRT is maintained 2. The view of BRT officer is neat 3. BRT has complete facilities in the bus 4. The accuracy of BRT departure 5. The officer's skillfulness in assisting to show the direction when asked by the passengers (direction-man) 6. The officer's skillfulness in assisting the passengers when having problem 7. The officer's skillfulness in keeping the bus cleanliness and comfort 8. The bus driver's skill in driving the bus 9. The polite and respectful treatment of BRT officer to the passengers without seeing their social status	1. The condition of BRT shelter is less well maintained 2. The lack of facilities in the bus shelter 3. The incompatibility of the officer in lowering the passengers 4. The minimal number of BRT fleets 5. The few corridors in BRT 6. The less professional operational system 7. The unintegrated BRT (not covering the whole Semarang City) 8. No special lane for BRT 9. Discrimination of price is too Lambe 10. The officer is less skilled in setting the queue of passengers 11. The officer shows busy impression when welcoming the costumers 12. The officer of shelter ticket is less skilled in ticketing service 13. The low safety level in the bus 14. The officer is less kind in giving service to the passengers like rarely saying thank you
Opportunity	Threat
1. The student bus program to overcome the price discrimination 2. The addition of bus fleets to make the passengers of Trans Semarang greater 3. The addition of corridors 4. Keeping the cleanliness more and more to make the passengers comfortable 5. Beautifying the view of BRT Office 6. Training the officer's hospitality to improve BRT service to increase the transport's demand 7. Making the additional corridors for Gunung Pati and Meteseh routes and for Tembalang – Guning Pati route to add the public transport demand of the university students	1. The increase in private vehicles 2. The profession improvement makes the consumption increases one level 3. The switching function of the bus shelter because BRT shelter is not well maintained 4. The worsening of BRT operational system 5. The specific lines are difficult to reach so that people in Semarang City is less interested in BRT 6. The price discrimination limits the passengers in student level 7. The lack of interest of Trans Semarang passengers makes Trans Semarang not as sustainable public transport

From the result of identifying the strength, weakness, opportunity, and threat presented above and the result of analyzing the Semarang city people's interest in Trans Semarang BRT, there are some planning strategies that should be conducted to make the public transports sustainable as follows:

- Repairing the condition of the shelters of Trans Semarang BRT that are less well maintained and less representatif
- Increasing the number of fleets
- Repairing and professionalizing the operational sys
- tem of Trans Semarang BRT

- Increasing the integration of Trans Semarang BRT Holding a special lane for BRT
- Decreasing the price discrimination
- Increasing the facilities in the bus shelter
- Holding trainings for the officers of BRT
- Increasing the safety of Trans Semarang BRT

IV. CONCLUSION

From the research conducted, it can be seen the people's interest measured based on the costumers' satisfaction with the transport service provided by Trans Semarang BRT is in good enough level, which shows that people's interest in the Rapid Transit Bus (BRT) of Semarang City is high enough.

To make Trans Semarang BRT the sustainable public transports, it requires a strategy of improving the quality of public transports. This can be conducted by the following strategies: repairing the condition of BRT's shelters that are less well maintained and less representative, increasing the number of fleets, repairing and professionalizing the operational system of Trans Semarang BRT, increasing the integration of Trans Semarang BRT, holding a special lane for BRT, decreasing the price discrimination, increasing the facilities in the bus shelter, holding trainings for the human resource development (the officers) of Trans Semarang BRT, and increasing the safety of Trans Semarang BRT.

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FINAL GRADE

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GENERAL COMMENTS

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