

How to Optimize Service Quality of City Bus in Bandung City

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Abstract: *The rapid growth of the population affects the increase in the number of private vehicles, but the increase is not matched by the ability of public transport in providing good services related to security, safety, comfort, affordability, and equality. This study aims to evaluate the service performance of the city bus so that it could be seen improvements of the performance of urban bus service in Bandung. The method of analysis used in this research was Importance Performance Analysis (IPA). Based on the IPA performance of urban bus service still needs to be improved. There are several service attributes that become the main priority in improving the performance of the city bus service that is security, safety, comfort, affordability, and equality both for bus stop and bus.*

Index Terms: *Service-Quality, City-Bus, IPA (Importance Performance Analysis),*

I. INTRODUCTION

Public transit buses in most urban areas are often considered to be a “greener” alternative to private vehicles (Eudy et al., 2014; Mahmoud et al., 2016; Wang.Y et al., 2017). The quality of public transport services is very important for the users of public transportation so that they still loyal to use the public transport (Ratanavaraha et al., 2016; Thompson and Schofield, 2007, Daniel.J. Margaret. et al. 2018). Previous research by (Rojo, 2012), showed that relationship between service quality and demand for inter-urban buses influenced by variables affecting user satisfaction. Those variables were the duration of the journey, cost, and number of daily journeys.

Bandung is a metropolitan city and also as the capital city of West Java province republic Indonesia has public transportation mode one of the public transportation is the city bus. Based on Bandung Central Bureau of Statistics 2017, the number of vehicles in 2016 reached approximately 1.25 million units, 94% of which are private vehicles. Susanto (2014), said that the problem of congestion can only be solved by the public switching using public transportation so that the use of the road more effective. Public vehicles in Bandung Raya include City Transport (Angkot), Diesel Train (Kereta Rel Diesel/KRD), and City Bus. The city bus is one of the most publicly-chosen public transportation of 15,533,806 users in 2016 (Damri public company/Perum Damri) and can solve the congestion problem since the city bus has a large size so it can carry more passengers than other public transport and also the cost which is relatively cheap ie between Rp 3000 - Rp10000.

According to Damri public company City Bus Units (Unit Angkutan Bis Kota) Bandung, since 2004 the city of Bandung has two types of city bus that is Bus Damri which began operating in 1978 and Trans Metro Bandung which

operated in 2004. Until now in 2017 there are 13 routes passed by in the Bandung city.

The performance of city bus can be seen from the service and its operation. According to Herdiana, Sony (2012) evaluation of Transport Service Performance Damri Bandung Based on the Perception of Users and Managers, the level of service level of Damri bus transportation in Bandung City such as security, tariff, travel time, and convenience. Low service levels may include inadequate facilities and infrastructure, prolonged travel time, number of passengers exceeding transport capacity, low level of comfort, inadequate network systems, difficult accessibility to certain areas, etc. (Dwiryanti and Ratnasari, 2013).

Building upon the previous research, this study aims to study service quality city bus.

II. PROBLEM STATEMENT

Service Performance Damri Bus Transport Bandung Based on Perceptions of Users and Managers, the level of service levels Damri bus transport in the city of Bandung such as security, rates, travel time, and convenience. Low service levels can include inadequate facilities and infrastructure, long travel time, number of passengers exceeding transport capacity, low level of comfort. Seeing the many problems that exist in City Bus in Bandung, it is necessary to study service quality city bus, so city bus could be a solution for traffic problems and could increase the number of passengers public transport.

III. THE AIM OF RESEARCH

Building upon the previous research, this study objective was to measure the service quality of city bus.

IV. METHOD OF RESEARCH

This research is conducted in Bandung City, West Java, Indonesia. Sample method used to know the passenger city bus in Bandung City. Slovin method used to take sample of passenger city bus (Sevilla, 1993 and Hariyani, 2017).

Where:

N = number of population

n = sample

e = margin of error (this study used $e= 10\%$).

The calculation using the above formula result to the number of the sample is 100 respondents. Where the number of population or passenger city bus in 2017 is 15,533,806 and $e=10\%$.

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To determine the factors that influence city bus's level of service in Bandung City using Importance Performance Analysis (IPA) (Martilla, 1977; Supranto, 2006; Arraningrum, 2013; Hariyani, 2017). IPA is an analytical tool used to compare performance and satisfaction felt by customers compared to the desired level of satisfaction. To assess the city bus's level of service use 45 attributes as shown in the Table 1. The attributes that were examined were measured using a Likert scale. Likert scale is ordinal measurement scale consisting of five levels and is weighted according to its level. IPA method requires the usage weighing both for level of satisfaction and level of importance, so that each attributes above was weighted. The weighing consist of 5 values which are 5 = very satisfied/very important; 4 = satisfied/important; 3 = fairly satisfied/ quite important; 2 = less satisfied/less important and 1 = not satisfied/not important. The relationship between the level of interest and the performance perceived by the customer illustrated in the diagram of Importance Performance Analysis as in Figure 1.

IPA is presented in a diagram consist of four quadrants which are:

1. Quadrant one meaning "Concentrate Here" (high importance and low satisfaction). Factors located in this quadrant is considered as very important factors for consumers, but the conditions is not satisfied. Factors located in this quadrant is a priority for improvement.

2. Quadrant two meaning "Keep up the Good Work" (high importance and high satisfaction). Factors located in this quadrant are considered as additional factors for customer satisfaction so that the management is obliged to ensure that the performance of the institutions under its management needs to continue to maintain the achievements. 3. Quadrant three, "Low Priority" (low importance and low satisfaction). Factors located in this quadrant have a low level of satisfaction and at the same time is not considered too important for the consumer, so that the management does not need to prioritize or paying much attention to these factors.

4. Quadrant Four, "Possible Overkill" (low importance and high satisfaction).

Table 1. Attribute to assess the city bus's level of service

Attribute	Bus Stop	Bus
1. Security	1. Lighting conditions 2. Security guard 3. Security information	4. Vehicle identity 5. Driver's identification 6. Alarm signal 7. Lighting conditions 8. Security guards 9. Window film
2. Safety	10. Traffic and transport equipment 11. Pelican lamp 12. Good pelican lamp condition 13. Fire extinguisher	14. Fire extinguisher 15. Glass-breaking hammer 16. Condition Brake 17. Rearview

		mirror 18. Passenger grip stands 19. Brake light conditions
3. Comfort	20. Lighting 21. Ventilation/air conditioning 22. Condition of ventilation/AC 23. Clean from garbage 24. Trash can 25. Plants around the bus stop 26. Passenger density	27. Lighting 28. Transport capacity 29. Air conditioning 30. Trash can 31. Passenger density
4. Affordability	33. Feeding mode 34. Distance between bus stops	32. Affordable price
5. Equality	35. Dedicated difabell path 36. Priority seats 37. Special wheelchair space	38. inter bus time 39. travel time of the bus 40. The length of the bus stop at the bus stop 41. departure schedule 42. Travel speed 43. Regular access in and out of passengers 44. Payment system 45. Information board

Source: Regulation of the Minister of Transportation of the Republic of Indonesia No. PM. 10 Year 2012



Figure 1. Importance Performance Analysis diagram.
Source: Martilla, 1977; Supranto, 2006

V. ANALYSIS AND DISCUSSION

Based on IPA analysis, the cartesian diagram consists of four quadrants can be seen in Figure 2. Here is a description of each of the attributes for both the bus and the bus stop attribute. which enter each quadrant.



Quadrant 1 Concentrte Here

Attribute Bus stop: Attribute number 20 lighting, number 23 clean from garbage, number 24 trash can, number 34 distance between bus stops, number 35 dedicated difabell path.

Quadrant 2 Keep up the good work

Attribute Bus:

Attribute number 4 vehicle identity, number 7 lighting conditions, number 15 glass-breaking hammer, number 16 condition brake, number 19 brake light conditions, number 27 lighting, number 29 air conditioning, number 30 trash can, number 31 passenger density, number affordable price, number 38 inter bus time, number 39 travel time of the bus, number 41 departure schedule, number 45 information board.

Attribute Bus Stop

Attribute number 33 feeding mode.

Quadrant 3 Low Priority

Attribute Bus:

Attribute number 1 lighting conditions, number 2 security guard, number 3 security information, number 10 traffic and transport equipment, number 11 pelican lamp, number 12 good pelican lamp condition, number 13 fire extinguisher.

Attribute Bus Stop:

Attribute number 5. driver's identification, number 8 security guards, number 21 ventilation/air conditioning, number 25 plants around the bus stop,

Quadrant 4 Possible over kill

Attribute Bus:

Attribute number 6 alarm signal, number 9 condition window film, number 14 Fire extinguisher, number 28 transport capacity.

Attribute Bus stop: attribute number 22 condition of ventilation/AC, number 26 passenger density.

Based on the results of IPA, the main priority attributes that need to be improved could be seen in Table 2.

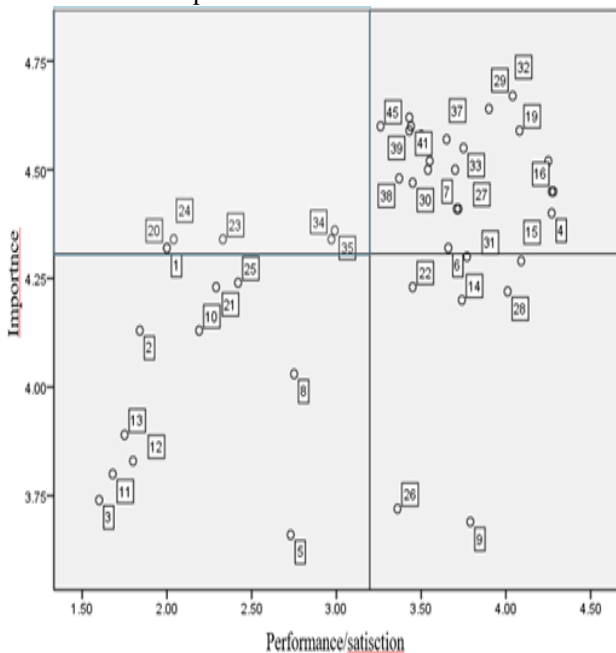


Figure 2. Importance Performance Analysis City bus services in Bandung City

Table 2. Attribute Priority Needs to be Improved in Bus Stop and Bus

1. Bus Stop: Attribute And Improvement	2. Bus : Attribute And Improvement
1. Security <ul style="list-style-type: none"> Added lights at the bus stop Procurement of security officers at bus stops 2. Safety <ul style="list-style-type: none"> The passenger's up and down system at the bus stop The addition of a complete first aid 3. Comfort <ul style="list-style-type: none"> Air Conditioner/AC Garbage bin 4. Affordability <ul style="list-style-type: none"> The addition of bus stops 5. Equity <ul style="list-style-type: none"> The design of bus stops should be more thoughtful to persons with disabilities 	1. Security <ul style="list-style-type: none"> Added lights at the bus Procurement of security officers at bus stops 2. Safety <ul style="list-style-type: none"> The passenger's up and down system at the bus The addition of a complete first aid 3. Comfort <ul style="list-style-type: none"> Air Conditioner/AC Garbage bin 4. Affordability <ul style="list-style-type: none"> Affordable price 5. Equity <ul style="list-style-type: none"> Design of floor tilt and bus-specific texture should be more concerned with disabled persons

VI. CONCLUSION

Based on the results of IPA analysis, it was found that the performance of urban bus service in Bandung city has to be improved the service quality. There are several service attributes that are the top priority in improving the performance of the city bus service that is security, safety, comfort, affordability, and equality. Improving the service performance of the city bus is a top priority of the city government, in order to attract more passengers to use the city bus as a mode of transportation

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REFERENCES

1. Arraningrum, Wuri, 2013. Peningkatan Kualitas Pelayanan Pegawai dengan Menggunakan Integrasi Metode Importance Performance Analysis (IPA)-Quality Function Dploymnt (QFD) Jejaring Administrasi Publik. Retrive 12 December 2017, from <http://journal.unair.ac.id/Download/fullpapers-dmpf8207b57feull.pdf>



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2. Basuki, Imam dan Susanto, Benidiktus. 2014. Kajian Penerapan Angkutan Umum Perkotaan Tanpa Bayar. *Proceedings The 17 th FSTPT International Symposium Vol.2 No.1, Jember University, 22-24 August 2014.*
3. Daniels M.J., Harmon. K, Laurlyn K., Vese Jr.Rodney., Park, Minkyung, Brayley. E, Russell. 2018. *Tourism Management* 64. Spatial dynamics of tour bus transport within urban destinations. pp.129-141
4. Dwiryanti, Aprisia Esty dan Ratnasari, Anita. 2013. Analisis Kinerja Pelayanan Bus Rapid Transit (BRT) Koridor II Terboyo –Sisemut (Studi Kasus: Rute Terboyo – Sisemut Kota Semarang). Semarang: Universitas Diponegoro. (*Jurnal Teknik PWK Volume 2 Nomor 3 tahun 2013*)
5. Eudy, L., Caton, M., Post, M., 2014. Transit Investments for Greenhouse Gas and Energy Reduction Program: Second Assessment Report. Technical Report No. 0064, Federal Transit Administration.
6. Hariyani, S. 2017. School bus's level of service in Malang City. *IOP Conf. Series: Earth and Environmental Science* 70 012023.
7. Herdiana, Sony. 2012. Evaluasi Kinerja Pelayanan Angkutan Bus Damri Kota Bandung Berdasarkan Persepsi Pengguna dan Pengelola. Bandung: Institut Teknologi Nasional. (*Reka Loka Jurnal Online Institut Teknologi Nasional*)
8. Mahmoud, M., Garnett, R., Ferguson, M., Kanaroglou, P., 2016. Electric buses: a review of alternative powertrains. *Renew. Sustain. Energy Rev.* 62, pp. 673–684.
9. Ratanavaraha, V., Jomnonkwo, S., Khampirat, B., Watthanaklang, D., & Iamtrakul, P. 2016. The complex relationship between school policy, service quality, satisfaction, and loyalty for educational tour bus services: A multilevel modeling approach. *Transport Policy*, 45, pp. 116-126.
10. Regulation of the Minister of Transportation of the Republic of Indonesia No. PM. 10 Year 2012 on Minimum Service Standards of Road-Based Mass Transportation
11. Sevilla, C.G., Jesus A.O., Twila G.P., Bella P.R., Gabriel G.U. 1993. *Research Methods*, Rex Printing Co. Inc., Quezon City.
12. Thompson, K., and Schofield, P. 2007. An investigation of the relationship between public transport performance and destination satisfaction. *Journal of Transport Geography*, 15, pp. 136-144.
13. Wang,Y, Huang. Y, Xu. J, Barclay.N. 2017. Optimal recharging scheduling for urban electric buses: A case study in Davis. *Transportation Research Part E* 100 pp. 115–132.