

Analysis Performance and Service Satisfaction of Transjakarta Bus Passengers Due to Changes in Routes (Case Study: Purpose of Pertamina Plumpang Stop Via PGC Early Route Toll - Plumpang Pertamina Becomes PGC - Cempaka Putih)

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Abstract

Transjakarta served 189.77 million passengers in 2018 (Andapita, 2019). According to the Central Bureau of Statistics, the number of passengers increased by almost 31% in 2018. Corridor L 10a is one of the routes owned by Transjakarta with the initial route PGC 2 and the last stop at Tanjung Priok. Koridor L 10 has 8 stops and the total trip duration for this route is approximately 45 minutes (Transjakarta, 2019). This study aims to determine the performance of Transjakarta buses on route changes by referring to the data obtained in the COVID-19 pandemic condition and to determine the level of passenger satisfaction with changes in the Transjakarta L10a route. This research is a quantitative study using the state preference survey method. The survey was conducted by distributing questionnaires directly and google form which functions to collect data from passengers in the form of passenger performance and satisfaction with Transjakarta. The population in this study are customers or passengers of the new Transjakarta route L10a PGC 2 - Plumpang Pertamina. The sample selection method used was nonprobability sampling method with convenience sampling technique so that 110 respondents were obtained as samples. Data processing was performed using Excel and SPSS programs. The results of the research after analyzing the results data obtained through surveys and questionnaires, it can be concluded that satisfaction with Transjakarta bus services and fleets due to route changes is relatively high.

Keywords :

BRT Performance, Customer Satisfaction, Transjakarta

1. Introduction

Transjakarta is one of the administrators for the Bus Rapid Transit BRT. Transjakarta began operations on January 15, 2004 and is a flagship program of the DKI Jakarta Provincial government in developing bus-based public transportation (Wikipedia, 2015).

Transit operations include activities such as scheduling, crew rotation, operation and provision of vehicles, fare collection, and system maintenance. Operations result in transportation offered to potential users. (Calabro and Wagenheim, 1981) defines several terms used in transit practice. (Khisty and Lall, 2006).

Transjakarta served 189.77 million passengers in 2018 (Transjakarta, 2019) based on the Central Statistics Agency, the number of passengers increased by almost 31% in 2018.

Corridor L 10a is one of the routes owned by Transjakarta with the initial route PGC 2 and the last stop at Tanjung Priok. Koridor L 10 has 8 stops and the total trip duration for this route is approximately 45 minutes (Wikipedia, 2015).

Table 1 . Transjakarta Minimum Service Standards

No.	Criteria	Size
1	Load Factor	Maximum 95%
2	Time Between: Busy time Hours Not Busy	7 minutes 15 minutes
3	Passenger Waiting Time	1 minute
4	Payment system The availability of a payment system E-ticketing at every travel stop	100%
5	Priority Seat for Persons with Disabilities	2-4 Seats
6	Space for Wheelchair Users	Minimum 1 space
7	Availability of Transportation Integration	100%
8	Bus travel speed	Maximum 50km / hour
9	Service Time	17 hours / day

Source: SPM Transjakarta, 2017 (BPK RI, 2017)

2. Methodology

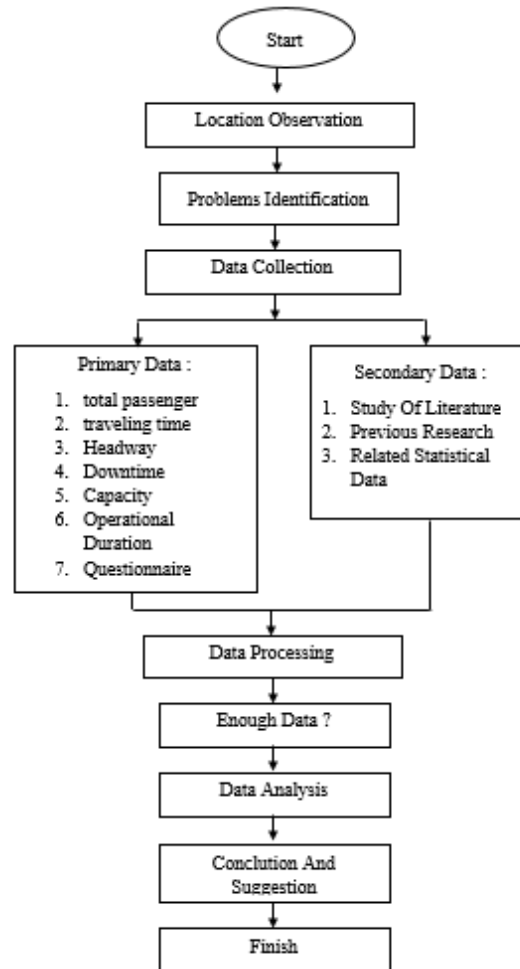


Figure 1. Research methodology

In conducting this research, the researcher went through several stages described in the flow chart above, which each process has several activities, including :

1. Observation of the location: At this stage, the researcher first observes the location of the bus stop that you want to research, the goal is to better identify the scope of the problems and needs that need to be researched. The things observed include research sites, bus stops, roads, types of buses, bus users, and others.
2. Problem identification: At this stage, the researcher will identify the problem from the observations that have been made.
3. Data collection: At this stage, the researcher will search and review existing data such as previous research, related statistical data, and necessary research journals. In addition to the existing data, the researcher also carried out calculations and interviews to obtain other necessary data.
4. Confirmation and Re-checking: At this stage, the researcher will confirm and double-check the data that has been collected. The data collected must match what is required in the calculation.
5. Data Analysis: At this stage, the researcher will perform calculations based on the data that has been collected. In conducting this analysis, the researcher used SPSS and Microsoft Excel calculation software.
6. Conclusions and Suggestions: At this stage, the results of the above calculations will be made a conclusion which will contain the research results and also suggestions. At this stage the researcher also ends the process of the research flow being carried out.

The object of research is something that is the main concern in a study, the object of this research is the target in research to get answers or solutions to problems that occur. The object of research in this study is the Analysis of Performance and Service Satisfaction of Transjakarta Bus Passengers Due to Changes in Routes (Case Study: Purpose of Plumpang Pertamina Bus Stop Via Toll Early Route PGC - Plumpang Pertamina Becomes PGC - Cempaka Putih)

3. Result and Analysis

After the survey process to the data analysis that has been carried out, some suggestions that could be input in the future for related parties include:

Table 2. Recapitulation of Analysis Results

No.	Bus Service Performance Indicators	Minimum Service Standards	Analysis Results Survey Data	Information
1	Load Factor	Maximum 95%	21.79%	It has been adequate
2	Traveling time	30-40 minutes	37.5 minutes	It has been adequate
3	Waiting time	Maximum 1 minute / stop	2,3 minutes	Insufficient
4	Headways	10 minutes	11.11 minutes	Insufficient
4	Frequency	6 Bus	3 Bus	Insufficient
5	Speed	10 km / hour	19.36 km / hr	It has been adequate
6	Service Time	17 hours / day	9 hours / day	Insufficient

Source: Research data, 2020

From the results of the survey conducted by the researchers, the quality and service quality of the PGC 2 route to Plumpang Pertamina and the Plumpang Pertamina route to PGC 2 was not sufficient, it can be seen from the observation that four of the six indicators observed did not meet the minimum service standards.

The following are some of the characteristics the researchers received from the respondents.

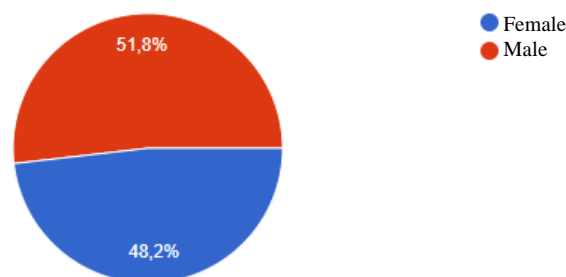


Figure 2. Graph of Respondent Gender Percentage

Based on diagram 4.1, it can be seen that the number of respondents in this study were 110 respondents. 51.8% male and 48.2% female.

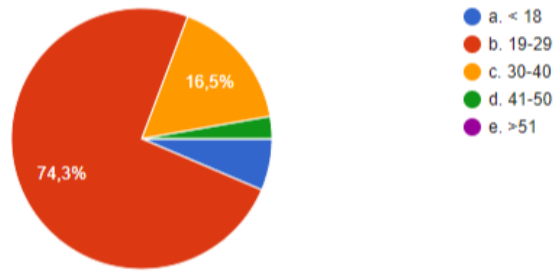


Figure 3. Age of Respondents Percentage Graph

Based on diagram 4.2, it can be seen that the age of the respondents in this study was grouped into: age 19-29 as many as 74.3%, age 30 - 40 years as much as 16.5%, age <18 years as much as 6.4%, age 41 years - 50 years as much as 2.8% and age > 51 as much as 0%.

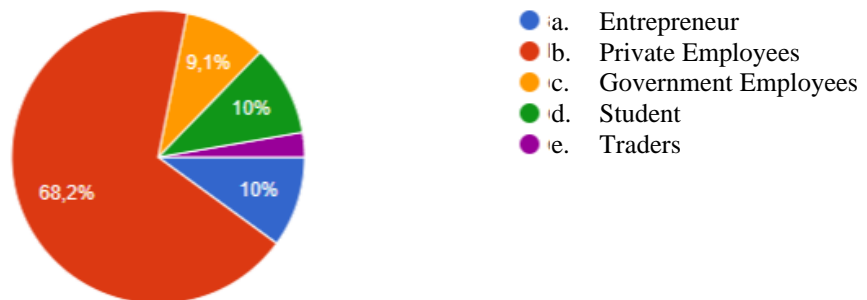


Figure 4. Percentage Graph of Respondents' Employment

Based on diagram 4.3, it can be seen that the respondent's activity or occupation using Transjakarta L. 10 is: 68.2% are private employees, 10% are entrepreneurs, 10% are students, 9.1% are civil servants and 2.7% are traders.

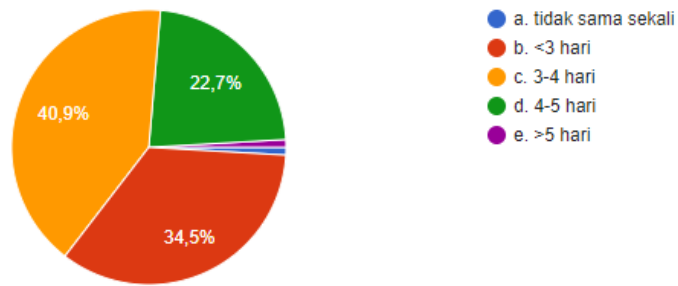


Figure 5. Graph of Respondents' Transjakarta Usage Percentage

Based on diagram 4.4, it can be seen that the use of Transjakarta by respondents is: 40.9% using 3-4 days, 34.5% using <3 days, 22.7% using 4-5 days, 0.9% using > 5 days and 0.9% did not use at all.

3.1. Validation Test

From the Simple Correlation Coefficient table for a significant level of 5% with a sample size of 108 (110-2), the R value is 0.1874.

Furthermore, the results of calculations using SPSS 21 software, obtained the following results:

Table 3. Service Validation Test

Statement	Service
	Pearson Correlation
P1	0.5970
P2	0.3900
P3	0.8340
P4	0.6500
P5	0.5940
P6	0.8340
P7	0.7600
P8	0.4840

Source: SPSS 21 Program Calculation Results

Service validation test above, as many as 8 questions on service variables were declared valid because they had a Pearson correlation (r count) greater than r table (0.1874).

Table 4. Performance Validation Test

Performance	
Statement	Pearson Correlation
K1	0.6740
K2	0.7900
K3	0.8690
K4	0.9110
K5	0.8080
K6	0.8320

(Source: SPSS 21 Program Calculation Results)

Performance validation test above, as many as 6 questions on the performance variable were declared valid because they have a Pearson correlation (r count) value greater than r table (0.1874).

3.2. Reliability Test

Discussion Discussion To test the reliability of data, it can be done with the following conditions:

1. If the Cronbach's Alpha value is > 0.60 then the questionnaire or questionnaire can be declared reliable or consistent.
2. Meanwhile, if the Cronbach's Alpha value < 0.60 then the questionnaire or questionnaire can be declared unreliable or inconsistent.

Table 5. Reliability Test of SPSS Alpha Cronbach Service

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item- Total Correlation	Cronbach's Alpha if Item Deleted
P1	30,582	11,548	.466	.778
P2	30,582	12,557	.229	.809
P3	30,682	9,852	.752	.730
P4	30,800	11,061	.517	.770
P5	31,000	11,211	.435	.784
P6	30,682	9,852	.752	.730
P7	30,564	10,762	.670	.749
P8	31,382	11,669	.281	.813

Case Processing Summary

		N	%
	Valid	110	100.0
Cases	Excludeda	0	.0
	Total	110	100.0

So that the results of the Cronbach Alpha Service reliability test are 0.795 (above the minimum number 0.6) which can be concluded that all instruments in this study can be categorized as reliable or consistent.

Table 6. Reliability Test of SPSS Alpha Cronbach Performance

Item-Total Statistics				
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
K1	19,609	15,506	.568	.895
K2	19,545	14,434	.707	.877
K3	19,618	13,339	.804	.861
K4	19,709	12,905	.863	.851
K5	19,664	13,950	.722	.874
K6	20,036	11,834	.707	.887

Case Processing Summary

		N	%
Valid		110	100.0
Cases	Excluded ^a	0	.0
Total		110	100.0

Reliability Statistics

Cronbach's Alpha	N of Items
.893	6

So that the results obtained from the Cronbach Alpha reliability test performance of 0.893 (above the minimum number 0.6) which can be concluded that all instruments in this study can be categorized as reliable or consistent.

3.3. Chi Square data

Table 7. Average Service

Service	Questionnaire Value					Total value
	1	2	3	4	5	
P1		2	3	31	74	110
P2		44	26	34	6	110
P3	5	50	24	25	6	110
P4		2	12	41	56	110
P5			21	45	43	110
P6			13	27	70	110
P7			10	22	78	110

Table 8. Average Performance

Performance	Questionnaire Value					Total value
	1	2	3	4	5	
K1		3	19	61	27	110
K2		2	23	48	37	110
K3	1	2	29	40	38	110
K4		6	30	40	34	110
K5		2	26	47	35	110
K6		27	25	22	36	110
$\sum (n = 10)$	1	42	152	258	207	660
Value (eu)	0.1	4,2	15.2	25.8	20.7	66

Table 9. X² Count

Score	(nu)	(eu)	(nu-eu)	(nu-eu) ²	(nu-eu) ² / eu
1	0.5	0.1	0.4	0.16	1.6
2	10.3	4,2	6.1	37.21	8.86
3	14.8	15.2	-0.4	0.16	0.01
4	26.6	25.8	0.8	0.64	0.02
5	35.8	20.7	15.1	228.01	11.01
Σ	88	66	22	484	7.33

From the above calculations, the value of X² is 7.33 with a significant value of 5% and the number of service factors observed is 8 with a scale value of 5 pieces, then it is calculated to find Table X² is

$$\alpha = 5\%, \text{ Service } (p) = 8, \text{ Scale Value } (h) = 5$$

$$\text{Degree of Freedom (df)} = (k-1) \times (h-1)$$

$$= (8-1) \times (5-1)$$

$$= 28$$

The X²Table value is obtained from the Chi Square table for the Probability Level of 5% with 28 degrees of freedom obtained 41.337.

3.4. Importance Performance Analysis

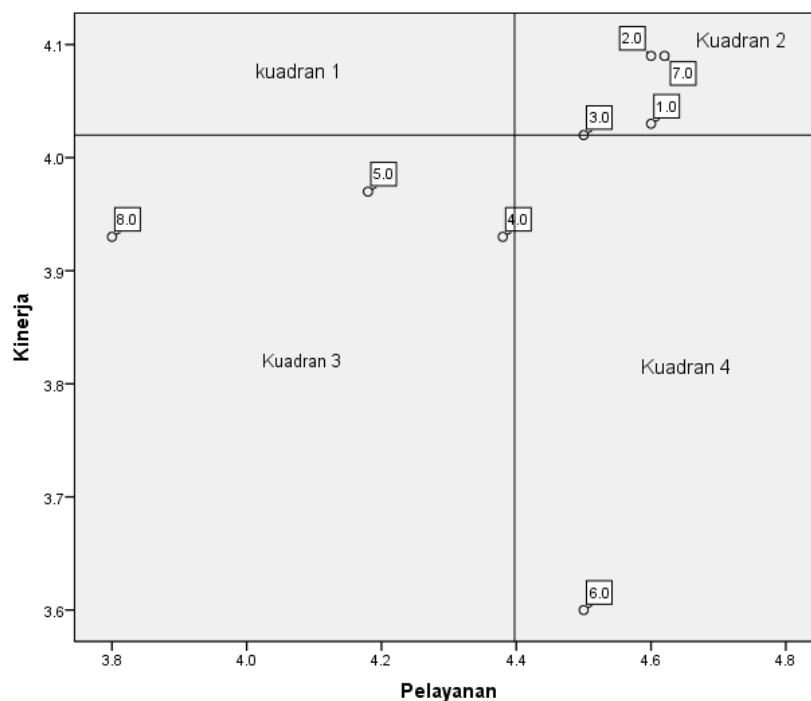


Figure 1. Importance Performance Analysis

Information :

- a. Quadrant 1 are factors that are considered important by customers, but are not yet according to customer expectations.
- b. Squad 2 are factors that are considered important by customers, with a relatively high level of satisfaction
- c. Quadrant 3 are factors that are considered less important by customers and their performance is not too special.
- d. Quadrant 4 are factors that are considered less important by customers and are considered too excessive.

From the results of the scatter graph above, it is obtained :

- a. Quadrant 1
no, it means that everything that the customer considers important is in accordance with customer expectations.
- b. Quadrant 2
The 1st attribute concerns the availability of a special waiting area for the elderly / pregnant women / persons with disabilities at the bus stop. The second attribute concerns Transjakarta's performance on the new route. The 3rd attribute concerns arrival time efficiency at the end of the Pertamina plumpang stop by using a new route.. The 7th attribute concerns the availability of priority seats for elderly passengers / pregnant women / persons with disabilities on the bus
- c. Quadrant 3
The fourth attribute concerns the availability of a special bus exit / entry route for the elderly and pregnant women. The 5th attribute concerns room temperature (AC) in the bus functioning properly. The 8th attribute concerns the availability of the Transjakarta bus route L 10a during the Covid 19 & PSBB pandemic.
- d. Quadrant 4
The 6th attribute concerns the availability of a special room for women on the bus

4. Conclusion and Suggestion

4.1 Conclusion

1. Transjakarta Bus Fleet Performance L10a
From the results of the survey conducted by the researchers, the quality and service quality of the PGC 2 route to Plumpang Pertamina and the Plumpang Pertamina route to PGC 2 was not sufficient, it can be seen from the observation that four of the six indicators observed did not meet the minimum service standards.
2. The level of customer satisfaction with Transjakarta bus services and fleets due to route changes
After analyzing the data from the results obtained through surveys and questionnaires, it can be concluded that satisfaction with Transjakarta bus services and fleets due to relatively high route changes can be seen in the results of the analysis of CHAPTER IV, four of the eight questionnaires distributed to 110 respondents mostly chose quadrant II where the factors - factors that are considered important by customers, with a relatively high level of satisfaction.
3. How to find out the efforts to solve the new Transjakarta route problem
After analyzing the data from the results obtained through surveys and questionnaires, efforts to overcome the problems of the new Transjakarta route need to improve the quality and service quality of the new route L10a facilities.

4.2 Suggestion

After the survey process to the data analysis that has been carried out, some suggestions that could be input in the future for related parties include:

1. It is necessary to add operational hours to the new route L10a and improve the quality and service facilities.
2. PT Transjakarta needs to continuously educate the public about the change in the L10a route and the benefits that can be obtained when using this route.
3. It is hoped that PT Transjakarta and the Department of Land Transportation will continue to re-observe the results of periodic evaluations that have been carried out. To find the best way to overcome shortcomings such as insufficient headway time.

References

- Andapita, V. (2019) *Revolutionary Transjakarta proves its relevance after 15 years*, *The Jakarta Post*. Available at: <https://www.thejakartapost.com/news/2019/01/15/revolutionary-transjakarta-proves-its-relevance-after-15-years.html> (Accessed: 27 January 2021).
- BPK RI (2017) *Pergub Prov. Dki Jakarta No. 33 Tahun 2017 Tentang Standar Pelayanan Minimal Layanan Angkutan Umum Transjakarta*, *BPK RI*. Available at: <https://peraturan.bpk.go.id/Home/Details/61224> (Accessed: 27 January 2021).
- Calabro, P. J. and Wagenheim, G. D. (1981) *Introduction to transportation*. New York: Macmillan. Available at: <https://trove.nla.gov.au/work/9643332> (Accessed: 27 January 2021).
- Khisty, C. J. and Lall, B. K. (2006) *Dasar-Dasar Rekayasa Transportasi*. Jakarta: Erlangga.
- Transjakarta (2019) *Transjakarta Bus Products and Services at, Transjakarta*. Available at: <https://transjakarta.co.id/> (Accessed: 27 January 2021).
- Wikipedia (2015) *Koridor 10 Transjakarta*, *Wikipedia*. Available at: https://id.wikipedia.org/wiki/Koridor_10_Transjakarta (Accessed: 27 January 2021).