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Preference of Female Passengers Towards Public Transportation Services in Makassar City

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Abstract

Passenger preferences, particularly those of women, are crucial for enhancing the quality of public transportation services in Makassar, where women constitute the majority of users. This study examines female passengers' preferences and satisfaction with public transportation services in Makassar, focusing on whether these services meet the Minimum Service Standards (SPM). Secondary data were obtained through a literature review of urban transportation SPMs and comparative studies, while primary data were collected via online questionnaires, interviews, and field observations. The sample was selected using non-probability sampling, and the data were analyzed using Importance-Performance Analysis (IPA) and comparative analysis. The study identified 7 criteria and 19 service indicators across areas such as service capacity, security, and comfort. The findings revealed that the pete-pete transportation system fell short in quality service indicators, whereas the Bus Rapid Transit (BRT) system had two high-quality indicators: first aid facilities and air circulation/temperature control. The study highlights the need for improvement in 11 service indicators for pete-pete and 6 for BRT, as perceived by female passengers.

1. INTRODUCTION

Makassar is one of the cities located in South Sulawesi Province. This city is a metropolitan area that serves as a center for government, trade, education, services, and more. With an increasing population growth rate and rising mobility needs, the public requires public transportation facilities that facilitate movement from one place to another. However, the needs of passengers, especially women, in public transportation are not met with service quality that aligns with the minimum service standards.

Public transportation is a facility provided by the government to meet the community's mobility needs. However, in reality, there is a lack of public interest in using public transportation in Makassar. The low usage of public transportation is based on the low level of user confidence in the ease of service and the uncertainty of travel times (Launtu et al., 2021). Female public transportation users often experience poor behavior from drivers and other passengers, leading to reluctance to use public transportation due to feelings of insecurity and discomfort (Sumbal, 2022). According to CATAHU Komnas Perempuan 2020, 58% of the 3,062 cases of sexual violence against women occurred in public spaces. The 2019 survey by the Safe Public Space Coalition (KRPA) also showed that sexual harassment on public transportation reached 15.77%. This phenomenon indicates that aspects of security and equality in public transportation have not received special attention from the government. This can be seen from the urban design and infrastructure that do not consider the needs of women, such as terminals and other public transportation services.

In Makassar, several critical issues with public transportation significantly impact female passengers and highlight the need for focused research. The high incidence of sexual harassment on public transportation, as indicated by KRPA data, creates a pervasive sense of insecurity for women, deterring them from using public transit and limiting their mobility. Additionally, the lack of female-friendly facilities—such as comfortable waiting areas, adequate lighting, and accessible emergency buttons—further exacerbates these safety concerns.

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The inconsistency in service quality, with some routes being notably better than others, adds to the unpredictability and discomfort experienced by female passengers. Furthermore, inadequate information and communication regarding schedules, routes, and fares, combined with limited public transportation options, force many women to choose between expensive private transport or risky public transit. These interconnected problems create a vicious cycle where low usage due to safety concerns leads to less investment in improving services, perpetuating the cycle of inadequate transportation. Addressing these issues through targeted research is essential to developing more inclusive and safer public transportation systems for women in Makassar.

According to Law Number 22 of 2009 concerning Road Traffic and Transportation, Article 141 paragraph (1) states that public transportation companies must meet the minimum service standards for urban transportation, which include: safety, security, comfort, affordability, equality, and regularity. In major cities like Jakarta and Surabaya, the proportion of female passengers is 55%, while male passengers account for 45%. According to Murdiono (2006), this is because women prefer to use public transportation as a means to get to work or other destinations. Female passenger satisfaction is important to consider because transportation is considered good for all gender groups if it is rated well by both women and men (Maffi et al., 2015). It is known that the service needs of each passenger differ, including between men and women. Therefore, it is necessary to identify the preferences of female public transportation users regarding the quality of public transportation services in Makassar. This study aims to determine (1) the criteria and indicators of public transportation services for women based on literature review, (2) the opinions and expectations of female passengers regarding public transportation services in Makassar, and (3) the priority directions for improving public transportation services based on the perceptions of female passengers.

Comparison Study 1: Bus Rapid Transit (BRT) TransJakarta

TransJakarta is a mass transportation service operated by PT Transportasi Jakarta. On April 21, 2016, PT Transportasi Jakarta launched a special bus for women. The bus is white and pink and operates only on Corridor 1. As the name suggests, this bus can only be used by female passengers, and it is driven by female drivers for added security. The bus features vehicle identification, an emergency number, CCTV to prevent criminal activities, and an emergency door. The existence of this special TransJakarta bus for women meets the needs of female users when using mass public transportation.

Comparison Study 2: "Pink" Public Transportation, Mexico City

Women-only public transportation in Mexico City has existed since 2002. The Mexico City government introduced a program with two systems: all female-only transportation is colored pink, and monitoring stations are established throughout the subway to encourage female passengers to report any form of harassment. This women-only public transportation gives special attention to female users to ensure their safety and equal rights to mobility, especially when using public transportation. Additionally, there are billboards, posters, stickers, and an emergency number that can be contacted 24 hours a day. The success of women-only public transportation in Mexico City is due in part to the role of the community, the government, and especially the opinions of female public transportation users.

2. METHODS

2.1 Research Method

This research is a descriptive quantitative study using a Likert scale with a questionnaire technique approach. The sampling method used in this context is a non-probability sampling technique. This sampling technique relies on the presence of subjects who happen to meet the researcher and are deemed suitable as data sources. If the subject is considered appropriate, then the subject will be taken as a sample (Etikan, 2017). According to Sugiyono (2015), Incidental/Accidental Sampling is a sampling method based on incidental events, meaning that respondents are anyone who happens to meet the researcher, fulfills the respondent criteria, and is deemed suitable as a research sample. In this case, the respondent criteria are female residents aged 17-65 years living

in Makassar City who have used public transportation in Makassar City. The population in this study includes female residents in Makassar City, which totals 742,002 (BPS Makassar City, 2024). The sample calculation method used is according to Isaac & Michael (1995), as shown in the table below:

Table 1. Sample Size Estimation at Error Levels of 1%, 5%, and 10% (Isaac and Michael, 1995)

N	S		
	1%	5%	10%
10	10	10	10
15	15	14	14
20	19	…	…
25	24	23	23
30	29	28	27
…	…	…	…
50000	655	346	269
75000	658	346	270
150000	661	347	270
…			
1000000	663	348	271
∞	663	349	272

With a female population of 742,002 in Makassar City and using the sample calculation method by Isaac & Michael (1995) with a 10% margin of error, the sample size obtained is 97, rounded up to 100 respondents. The sample obtained can already represent the population. This study will include a diverse range of female public transport users from different neighborhoods and demographic backgrounds in Makassar. This approach helps in capturing a variety of perspectives and experiences relating to public transport services, thereby increasing the generalizability and validity of the research findings.

2.2 Data Analysis Methods

The methods used in data analysis include literature review analysis and comparative analysis to determine the criteria and indicators of public transportation services for women. Importance Performance Analysis (IPA) is used to score the performance level and the expectation level of public transportation services based on female passengers' perceptions to obtain quadrant analysis results. The responses for performance level and expectation level can be seen in tables 1 and 2.

Table 2. Performance Level Scores

Performance Level (X)	Score
Very Good	5
Good	4
Fair	3
Poor	2
Very Poor	1

Table 3. Expectation Level Scores

Expectation Level (Y)	Score
Very Important	5
Important	4
Fair	3
Less Important	2
Not Important	1

Next, the scores from the performance level (X) and expectation level (Y) are tabulated into IBM SPSS Statistics 22. The results from SPSS will determine the indicators whose services need to be improved. In IPA analysis, the SPSS results are divided into four quadrants: quadrant I (high priority), quadrant II (maintain performance), quadrant III (low priority), and quadrant IV (excessive).

3. RESULT AND DISCUSSION

3.1 Criteria and Indicators of Public Transportation Services for Women

Based on the results of literature review analysis and comparative analysis by comparing SPM, previous research, and benchmarking, criteria and indicators of public transportation services for women were obtained. The analysis of criteria and indicators of services for women can be seen in Table 3.

Table 4. Results of Literature Review and Comparative Analysis of Public Transportation Services for Women

No.	Literature Review	Variable and Indicators
Minimum Service Standards		
1.	Standar Pelayanan Minimal Angkutan Orang Dengan Kendaraan Bermotor Umum Dalam Trayek (Peraturan Menteri Perhubungan RI Nomor PM 98 Years 2013)	• Security (Vehicle identity, crew identity, public transport lighting facilities) • Safety (Driver's physical condition, driver competence, traffic discipline, health facilities (first aid kit), smoking ban in public transport, travel disruption information) • Comfort (Passenger density, seating conditions, temperature inside the transport, cleanliness inside the transport) • Affordability (Accessibility of public transport, transport fares) • Equality (Priority seating for disabled, elderly, and pregnant women, wheelchair storage space) • Regularity (Service information)
Previous Research		
1.	Desain Layanan Kendaraan Umum untuk Wanita Berbasis *Fuzzy*-Kano *Quality Function Deployment* (QFD) (Prihono, 2012)	• Emergency contact information • Service information • No smoking policy on public transport • Reserved seats for women
2.	Kota Surabaya: Pelayanan transportasi umum bus damri khusus wanita di Kota Surabaya (Dinny Octaviane Wasistya, 2013)	• Security • Safety • Comfort • Affordability • Equality • Regularity
3.	Model Kebutuhan Angkutan Umum Khusus Perempuan (*The 17th FSTPT International symposium 2014, Jember University)* (Atik Wahyuni, Achmad Wicaksono, Ludfi Djakfar, Harnen Sulistio)	• Fare • Special seating for women, mothers, children, and elderly • Security personnel

No.	Literature Review	Variable and Indicators
4.	*Gender in Public Transportation. A persepective of Women Users of Public Transportation*. (Sahar Aloul, dkk. 2018)	• Accessibility • Harassment and security • Travel patterns • Routes taken • Friendliness of staff
6.	Layanan *Bus Rapid Transit* Purwokerto-Purbalingga pada Pengguna Wanita Menuju Kesiapan Dimensi *Smart Mobility* (Fauzan Ramadlon, 2021) Warta penelitian perhubungan	• Timeliness of BRT arrival at destination • Affordable BRT ticket prices • BRT being a safe and comfortable mass transit option • Good integration of BRT with other modes of transportation
5.	Pengembangan model pengukuran tingkat pelayanan transportasi umum yang ramah gender, anak, dan kelompok berkebutuhan khusus (Bayu Kania dan Linda Aisyah, 2021)	• Tingkat keamanan dalam angkutan • Keselamatan (Kompetensi supir, ketertiban lalu lintas) • Kenyamanan (kebersihan dalam angkutan, kepadatan penumpang, kondisi tempat duduk • Ketersediaan fasilitas penunjang (toilet khusus wanita, musholla yang dapat diakses difabel, fasilitas penerangan, ruang menyusui • Perilaku pengemudi • Ketertiban pengemudi dijalan • Sikap pengemudi ramah dan sopan • Petugas tanggap dalam membantu • Tempat duduk prioritas
Studi Banding		
1.	Kota Meksiko: Women-Only Transportation: How "Pink" Public Transportation Changes Public Perception of Women's Mobility (Amy Dunckel-Graglia, 2013)	• Security level within transportation • Safety (Driver competence, traffic discipline) • Comfort (Cleanliness inside the transport, passenger density, seat conditions) • Availability of supporting facilities (Women's dedicated toilets, accessible prayer rooms for people with disabilities, lighting facilities, nursing rooms) • Driver behavior • Driver discipline on the road • Friendly and courteous driver attitude • Responsive personnel in assisting • Priority seating
2.	Kota Jakarta: BRT Trans Jakarta Khusus Perempuan (PT. Transportasi Jakarta, 2016)	• Affordability (Fare) • Service Capacity (Availability of seats for women on mixed transportation) • Safety (Travel disruption information) • Regularity (Service information)

From the results of literature review analysis and comparative analysis in the table above, criteria and indicators of public transportation services for women were identified, namely 6 criteria and 20 indicators. These include safety, security, comfort, affordability, equality, and safety.

Table 5. Variables and Indicators of Public Transportation Services for Women

No	Variable	Indicator
1.	**Service Capacity**	• Special seats for women • Service at crowded points for potential female passengers

		• Storage area for belongings inside the transportation
2.	**Security**	• Vehicle identification • Lighting facilities • Security against criminal acts
3.	**Safety**	• Physical condition, driver competence, and discipline • First aid facilities • Emergency contact information
4.	**Comfort**	• Passenger density • Seat condition • Air circulation/ room temperature facilities • Cleanliness facilities • No smoking signs
5.	**Accessibility**	• Accessibility of transportation • Transportation fares
6.	**Equality**	• Priority seating for disabilities, elderly, and pregnant women • Wheelchair storage space
7.	**Regularity**	• Service information

3.2 Characteristics of Female Public Transportation Users in Makassar City

a. Socio-Economic Characteristics of Female Pete-pete Public Transportation Users in Makassar City. Socio-economic characteristics based on age, education, occupation, and income levels in Makassar City, as shown in the following table:

Table 6. Socio-Economic Characteristics of Female Pete-pete Public Transportation Users

Social Economic Characteristics	Item	Frequency
Age	=< 17 Years	3
	18– 65 Years	96
	>65 Years	1
Education	Elementary School	0
	Junior/Senior High School	3
	College/University	97
Type of Work	Occupation Student	77
	Entrepreneur	10
	Housewife	6
	Civil Servant	7
Income Level	<Rp. 1.000.000	63
	Rp. 1.000.000 – Rp. 1.500.000	16

Social Economic Characteristics	Item	Frequency
	Rp. 1.500.000 – Rp. 2.000.000	5
	Rp. 2.000.000 – Rp. 2.500.000	4
	>Rp. 2.500.000	12

b. Socio-Economic Characteristics of Female BRT Users in Makassar City. Socio-economic characteristics based on age, education, occupation, and income levels in Makassar City, as shown in the following table:

Table 7. Socio-Economic Characteristics of Female BRT Users

Social Economic Characteristics	Item	Frequency
Age	=< 17 Years	7
	18– 65 Years	93
	>65 Years	0
Education	Elementary School	0
	Junior/Senior High School	5
	College/University	95
Type of Work	Occupation Student	76
	Entrepreneur	10
	Housewife	12
	Civil Servant	2
Income Level	<Rp. 1.000.000	51
	Rp. 1.000.000 – Rp. 1.500.000	20
	Rp. 1.500.000 – Rp. 2.000.000	8
	Rp. 2.000.000 – Rp. 2.500.000	12
	>Rp. 2.500.000	9

3.3 Preferences of Female Passengers Towards Public Transportation Services in Makassar City

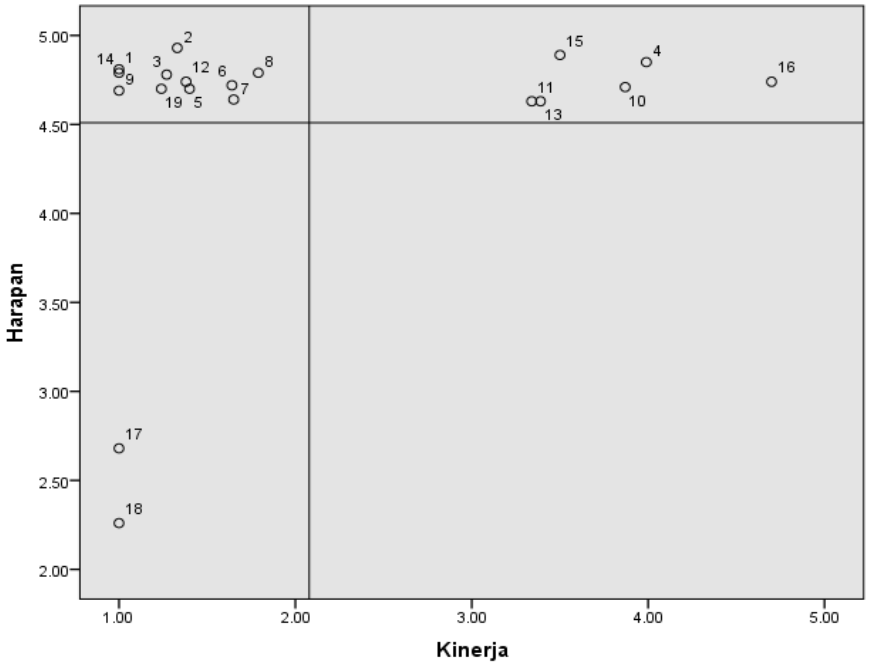
This analysis aims to determine the assessment of female passengers towards public transportation services in Makassar City. This study involves a sample of 100 female respondents who have used public transportation. The perceptions of female passengers are evaluated based on 19 questions regarding the services provided by

public transportation for women. The average performance and expectation levels of pete-pete public transportation can be seen in Table 8.

Table 8. Performance Score and Expectation Level of Pete-Pete Public Transportation Services

Indicator	Performance Level (X)	Expectation Level (Y)
1	1.00	4.81
2	1.33	4.93
3	1.27	4.78
4	3.99	4.85
5	1.4	4.7
6	1.64	4.72
7	1.65	4.64
8	1.79	4.79
9	1.00	4.69
10	3.87	4.71
11	3.34	4.63
12	1.38	4.74
13	3.39	4.63
14	1.00	4.79
15	3.5	4.89
16	4.7	4.74
17	1.00	2.68
18	1.00	2.26
19	1.24	4.7

Based on the performance score and expectation level data from female passengers towards pete-pete public transportation services, it is found that according to the perceptions of female passengers, there are no quality indicators for pete-pete public transportation services. In contrast, for BRT, there are 2 indicators that are of very high quality (>100%), namely first aid facilities (P3K) and air circulation/room temperature facilities, and 1 indicator of quality (=100%), which is the presence of no-smoking signs in the vehicles. Subsequently, quadrant analysis was conducted using IBM SPSS Statistics 22, divided into 4 quadrants, as shown in the following Picture.



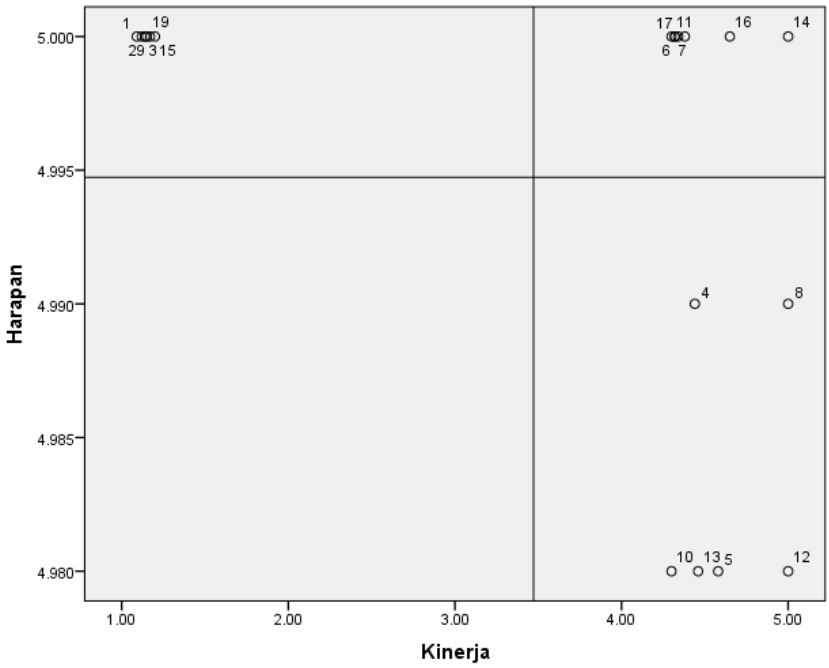
Picture 7. Quadrant of Importance Performance Analysis for Pete-pete Public Transportation
Source: Results of IBM SPSS Statistics 22 application analysis

The average performance score and expectation level of Bus Rapid Transit services based on female passengers' perceptions can be seen in the following table.

Table 9. Performance Score and Expectation Level of BRT Services

Indicator	Performance Level (X)	Expectation Level (Y)
1	1.09	5.00
2	1.12	5.00
3	1.14	5.00
4	4.44	4.99
5	4.58	4.98
6	4.32	5.00
7	4.32	5.00
8	5.00	4.99
9	1.17	5.00
10	4.3	4.98
11	4.3	5.00
12	5.00	4.98
13	4.46	4.98
14	5.00	5.00
15	1.2	5.00
16	4.65	5.00
17	4.34	5.00
18	4.38	5.00
19	1.15	5.00

Based on the data of performance scores and expectation levels from female passengers regarding Bus Rapid Transit services, the quadrant analysis results were obtained using IBM SPSS Statistics 22, which are divided into 4 quadrants.



Picture 8. Importance Performance Analysis Quadrants for BRT
Source: Analysis results from IBM SPSS Statistics 22 application

3.4 Recommendations for Improving Public Transportation Services for Women in Makassar City

To enhance public transportation services for women in Makassar City, improvements should be focused on items that have low performance but high expectations, identified in quadrant I.

The pete-pete public transportation system has 11 items in quadrant I, namely: designated seats for women in mixed transport, service at crowded points for prospective female passengers, storage areas for belongings in the transport, interior lighting facilities, security against criminal activities, driver's physical condition, competence, and discipline, first aid facilities (P3K), emergency contact information, air circulation/room temperature facilities, no-smoking signs on the transport, and service information. Meanwhile, Bus Rapid Transit (BRT) has 6 items in quadrant I, namely: designated seats for women in mixed transport, service at crowded points for prospective female passengers, storage areas for belongings in the transport, emergency contact information, transport affordability, and service information. The indicators listed for both the pete-pete and Bus Rapid Transit (BRT) systems are crucial for addressing the specific needs and safety concerns of female passengers, thereby influencing their overall satisfaction with public transportation, namely:

1. Designated Seats for Women: Providing reserved seats for women in mixed transport enhances comfort and safety, helping to prevent unwanted interactions and ensuring that women have a safe space, especially in crowded conditions.

2. Service at Crowded Points: Ensuring that there is adequate service at points where female passengers gather helps manage crowd flow and reduces the risk of harassment or discomfort during boarding and alighting.

3. Storage Areas for Belongings: Safe and accessible storage areas prevent overcrowding and protect personal belongings, contributing to a more organized and comfortable travel experience.

4. Interior Lighting Facilities: Proper lighting within transport vehicles improves visibility and enhances safety, making passengers feel more secure and less vulnerable to theft or harassment.

5. Security Against Criminal Activities: Measures such as surveillance or on-board security personnel are essential for deterring and addressing criminal activities, thus reducing safety concerns for female passengers.

6. Driver's Physical Condition, Competence, and Discipline: A driver's fitness and professionalism impact the overall safety and quality of the ride. Well-trained and disciplined drivers contribute to a safer and more reliable service.

7. First Aid Facilities (P3K): Availability of first aid facilities ensures that immediate medical assistance can be provided in case of accidents or health issues, enhancing the safety and reliability of the service.

8. Emergency Contact Information: Clear and accessible emergency contact information allows passengers to quickly report incidents or seek help, improving overall security and response efficiency.

9. Air Circulation/Room Temperature Facilities: Adequate air circulation and comfortable temperature settings contribute to a pleasant travel experience, reducing discomfort and making the journey more enjoyable.

10. No-Smoking Signs: Enforcing no-smoking policies helps maintain a clean and healthy environment, which is particularly important for passengers sensitive to smoke or with respiratory conditions.

11. Service Information: Providing clear and up-to-date service information, including schedules and route details, helps passengers plan their journeys better and reduces uncertainty, leading to increased satisfaction.

Addressing these indicators effectively can significantly improve the quality of public transportation for female passengers, leading to higher satisfaction levels and increased use of public transport systems.

4. CONCLUSIONS

From the above description, it can be concluded that there are 7 criteria and 19 indicators of public transportation services for women, namely service capacity, security, safety, affordability, regularity, comfort, and equality. Based on the perceptions of female passengers, it was found that there are no high-quality indicators for pete-pete public transportation, while for BRT, there are 2 indicators with very high quality (>100%), namely first aid facilities (P3K) and air circulation/room temperature facilities, and 1 indicator with high quality (=100%), which is the presence of no-smoking signs on the transport. The main priority directions for improving public transportation services based on the perceptions of female passengers identified 11 service indicators for pete-pete public transportation and 6 service indicators for Bus Rapid Transit based on quadrant analysis from the Importance Performance Analysis assessment.

This study faces several limitations that need to be considered. First, the relatively small sample size may make the results of the study not fully representative for the entire population of women public transportation users in Makassar. In addition, this study only focuses on women's perceptions without considering the perspectives of other user groups, such as men or people with disabilities, who may provide different views on service quality. The research instruments used have also not been empirically tested before, so there is a possibility of bias in the measurement of research variables. Finally, public transportation conditions in Makassar may change over time, which means the results of this study may not remain relevant in the long term.

5. ACKNOWLEDGMENTS

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