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Original Article

Performance of Inter-City Transport within the Province in Improving Regional Accessibility

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Abstract *- In the context of accelerated regional expansion and mounting demands for enhanced mobility, public transportation systems are compelled to optimize their efficiency and ensure passenger satisfaction. The objective of this study is to evaluate the performance of Intercity Public Transportation (AKDP) within East Kalimantan Province, with a particular emphasis on the Samarinda–Balikpapan bus route. Employing a quantitative approach, this research collected data from 200 AKDP users by administering structured questionnaires and the subsequent statistical analysis using multiple linear regression. The findings indicate that among the various performance indicators examined, service quality and comfort have a statistically significant impact on perceived regional accessibility. While infrastructure and frequency demonstrated a positive association, their individual effects were not significant. The strategic recommendations outlined in this study are of paramount importance in enhancing accessibility and addressing the evolving transport demands of East Kalimantan, particularly within the context of Indonesia's new capital development.*

Keywords *- Intercity transport, Regional accessibility, Service quality, Public transportation, East kalimantan.*

1. Introduction

Transport plays a vital role in the economic and social development of a region, but it also causes congestion. The presence of public transport can actually be a solution to relieve these problems, but the increasing ownership of private vehicles and the unbalanced development of road infrastructure further exacerbate these conditions. Intercity Transportation Within Provinces (AKDP) is one of the public transportation systems that forms the backbone of inter-regional connectivity, especially in the Kalimantan region, where the economy is experiencing rapid growth. In East Kalimantan alone, the economy grew by 6.22 percent in 2023, higher than the previous year, when it only reached 4.48 percent [1]. This has an impact on the level of purchasing power of the people to fulfil their needs, including private vehicles-which is directly proportional to the increase in their mobility-thereby increasing traffic congestion in the region, especially Kota Samarinda and Kota Balikpapan, which are buffer zones for the capital city.

This study specifically examines the performance of AKDP (Bus) transport on the Samarinda-Balikpapan route. This route was chosen because both cities are centres of economic activity and government in East Kalimantan Province, one of the provinces with rapid population growth and urbanisation in Indonesia. With the status of Samarinda City as the provincial capital, it is important to identify problems in depth regarding the performance of transport (AKDP) on the route in developing accessibility between regions in East Kalimantan. Accessibility is a measure of convenience or ease of how land use locations interact and how easy or difficult they are to reach through the transport network system [2]. This accessibility indicates whether or not the public transport facilities are good.

The Regulation of the Minister of Transportation of the Republic of Indonesia on the Implementation of Transport of Persons by Public Vehicles has regulated various determinations of the origin and destination terminals of each route as well as the determination of stopover terminals - at least type B in the form of airports, ports, and train stations [3]. However, the existing conditions do not match what is expected - where the departure of the Samarinda-Balikpapan route from Sungai Kunjang Terminal in Samarinda City still often picks up passengers at three unofficial points, causing the duration of waiting time to increase, making the AKDP bus public transport ineffective and inefficient.

The low level of service of AKDP buses in Kota Samarinda adds to the transportation problems. In addition to the waiting time that increases due to unofficial actions, the comfort of the transport is also one of the important things to consider. The reality in the field shows that there are still many AKDP buses operating on the Samarinda-Balikpapan route

that ignore the condition of their vehicle facilities, such as passenger seats that are no longer suitable, seat belts that do not function, bus bodies that are damaged, and vehicle air conditioners that are just for display. In addition to these things, the presence of hawkers who are free to sell on the bus further reduces the comfort of its passengers. Seeing the many problems that exist further increases the urgency for this research to focus on the performance of transport services (AKDP) within the East Kalimantan Province, especially on the Samarinda-Balikpapan route, based on the perceptions of their service users.

2. Literature Review

Recent studies on public transportation performance have emphasized the role of accessibility, service quality, and strategic planning in improving regional connectivity. Hluško *et al.* (2024) examined public transportation in Bratislava using a combination of survey instruments, in-depth interviews, and Geographic Information System (GIS)-based spatial analysis. Their findings indicated that both infrastructure and accessible information are critical to inclusive mobility. Similarly, Montoya, Escobar, and Moncada (2024) underscored the significance of passenger perceptions in shaping the spatial distribution of bus stops, particularly regarding safety and service equity.

The quality of service and the user's satisfaction remain central themes across various contexts. Ong *et al.* (2024) employed the SERVQUAL model in the Philippines to illustrate how trust and interpersonal interactions in motorcycle taxi services influence satisfaction.

Atombo and Wemegah (2021) conducted a study of high-occupancy buses in Ghana and found significant discrepancies between users' expectations and their perceptions. The study identified affordability and availability as key factors contributing to satisfaction.

Concurrently, other studies have centered on systemic shifts and governance. Hahn, Pakusch and Stevens (2023) demonstrated that expanding public transportation services in Germany resulted in a modal shift from private cars to public transportation. This shift was facilitated by the implementation of incentives and the enhancement of infrastructure. In their 2023 study, Goodland and Potoglou examined the resilience of public transportation in Great Britain in the post-pandemic era, underscoring the necessity for comprehensive ticketing and financial restructuring. Concurrently, Khan, Hrelja and Pettersson-Löfstedt (2021) underscored the pivotal role of planning principles and robust governance in Sweden, which catalyzed an augmentation in public transportation utilization. The efficacy of this initiative has been ascribed to the implementation of enhanced corridor services and the fostering of inter-organizational collaboration.

Equity and operational efficiency have also emerged as significant concerns. As posited by Vermesch, Boisjoly and Lachapelle (2021), the frequency of buses should be augmented in order to provide enhanced service to low-income workers. Similarly, Gkiotsalitis (2021) demonstrated that the optimization of scheduling and bus holding has the potential to result in a substantial reduction in passenger wait times. Zhou *et al.* (2023) ultimately determined that integrating Mobility-as-a-Service (MaaS) platforms with pricing strategies and mobility hubs have the potential to curtail car dependency and encourage sustainable travel behaviors in Dutch metropolitan regions.

A collective examination of these studies suggests a multi-dimensional approach to enhancing public transportation performance, integrating infrastructure enhancements, user-centered service quality, inclusive planning, and supportive policy frameworks. Consequently, the evaluation of Inter-City Transport within the Province (AKDP) on the Samarinda–Balikpapan route must take into account user perceptions and be informed by best practices from both developed and developing contexts.

3. Research Design

This study employs a quantitative research approach, utilizing a survey method as the primary data collection technique. The research was conducted along the intercity within-province (AKDP) bus route connecting Samarinda and Balikpapan, East Kalimantan, Indonesia. The selection of this route is attributable to the strategic significance of both cities as regional economic and administrative centers and their function as supporting zones for the new national capital (IKN Nusantara). The primary data were collected through the administration of structured, close-ended questionnaires to passengers of the AKDP bus route. The respondents were tasked with evaluating a series of indicators of public transportation performance, utilizing a five-point Likert scale. Supplementary interviews were conducted to ensure the robustness of the findings and the validity of the responses. Secondary data were obtained through a literature review of relevant scholarly articles, policy documents, and government regulations.

The independent variables (X) in this study include six key indicators of bus performance: vehicle quality (X1), travel speed (X2), terminal facilities (X3), service quality (X4), comfort and safety (X5), and headway and frequency (X6). The dependent variable (Y) is regional accessibility, which is assessed through indicators such as the availability of transport alternatives, ease of access to transportation services, and improvements in population mobility and travel time efficiency. Multiple linear regression analysis was performed using SPSS version 30.00 to analyze the relationship between the variables. The validity of the instruments was ensured through a series of validity tests, followed by a reliability analysis to assess the consistency of the responses.

Furthermore, F-tests and t-tests were conducted to evaluate the significance of the independent variables both simultaneously and individually. In case the significance value is <0.05, then the model regression that has been developed can be considered to fit appropriately. When this deficiency value occurs at 0.001, which is still less than 0.05, it can be stated as an independent variable that, along jointly, has a significant influence on the dependent variable (Y). In the case this deficiency value is less than 0.05, that implies significant influence; there is a significant effect otherwise exact value of 0.05 in regards to whether an independent variable has a dependence on the dependent variable; the basis is by looking at the calculated T value.

3.1. Research Sample

In this study, the sampling used the Slovin technique with a confidence level of 95 percent or an error chance of 5 percent. The Slovin formula can calculate the amount of n used as a sample with N (Population) known [14].

Assuming AKDP bus passengers are approximately 20 passengers with 19 buses operating in one day, a population of 380 passengers is obtained.
The formula used is ;

$$n = \frac{N}{1+Ne^2} \quad (1)$$

Description:
n = number of sample sizes
e = desired level of confidence/accuracy
N = Bus passenger population is 398 passengers in a day and
e = (confidence/error level) chosen is 5%, then:
n = 380 / 1 + (380 * $(0{,}05)^{(2}$)
= 380 / 1 + 0,95
= 380 / 1,95
= 194,871

Then, the sample used in this study was rounded up to 200 samples.

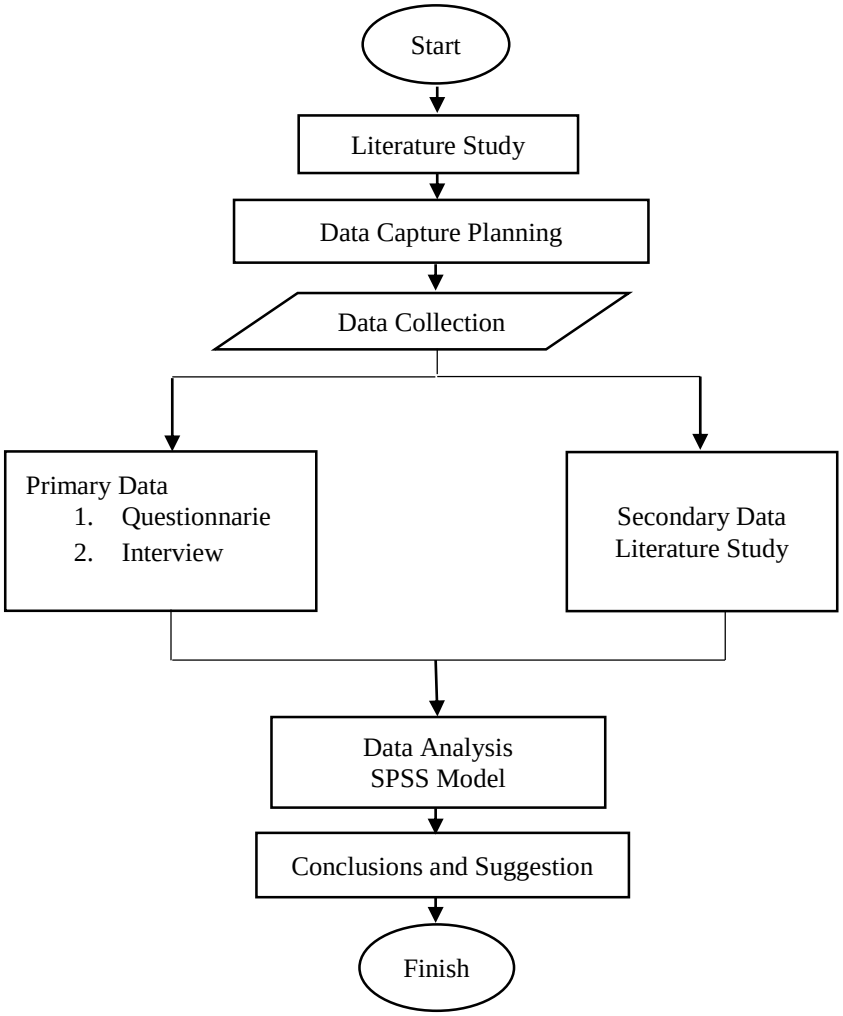

Fig. 1 Outline of the research process

4. Results and Discussion

4.1. Analysis

The study employed a quantitative approach using structured questionnaires administered to 200 respondents. The respondents were stratified by gender, age, education, occupation, and income level, allowing for a nuanced analysis of accessibility patterns based on socio-demographic characteristics. The findings indicate a slight predominance of male passengers (52%) over female passengers (48%), with the largest age group of users falling between 21 and 30 years old (54%). Furthermore, a considerable proportion of users possess a higher education degree (68%), and a majority are private sector employees (33%), with income primarily below IDR 2 million per month (31%).

Table 1. Overview of respondent demographics

Variables	Frequency	Percentage
Gender		
Male	104	52
Female	96	48
Age		
10 – 20 years	28	14
21 – 30 years	107	54
31 – 40 years	33	17
41 – 50 years	15	8
≥ 51 years	17	9
Education level		
Elementary School	2	1
Junior High School	9	5
High School	43	22
Bachelor's degree	136	68
Other (Not in school / Not graduated)	10	5
Employment		
Civil Servant	11	6
Private Employee	65	33
Self-employed	25	13
Student	46	23
Other	39	20
Not working/ unemployed	14	7
Income level		
< 2 millon	61	31
2 – 3 millon	46	23
3 – 5 millon	43	22
> 5 millon	50	25

Source: Prepared by the author

Descriptive statistical analysis revealed that the overall quality of bus services, including vehicle condition and amenities, was rated "Good" (mean score: 3.55). The variable for speed also demonstrated a favorable score (3.57), as did service quality (3.74) and comfort (3.63). However, the quality of the terminal was assessed lower, falling into the "Moderate" category (3.11), indicating a need for infrastructure improvements. The accessibility of the AKDP bus route was assessed as "Moderate" (3.33), indicating that while the route is operational, there are still perceived limitations in terms of ease of access and user experience.

Multiple linear regression analysis further elucidated the relationships among the variables. The model demonstrated a strong fit, as indicated by an Adjusted R-Square value of 0.668. This value indicates that approximately 66.8% of the variation in regional accessibility could be explained by the independent variables combined. The F-test confirmed the statistical significance of the overall model (Sig. < 0.001).

However, the T-test revealed that only two variables—service quality (X4) and comfort (X5)—exhibited significant individual effects on regional accessibility (Sig. < 0.001 for both). The bus quality, speed, terminal quality, and headway/frequency variables exhibited a positive association; however, they did not attain statistical significance in isolation.

Table 2. Summary of frequency distribution per instrument item

Item	Frequency per answer choice					Mean score	
	Very Bad	Not Good	Fair	Good	Very Good		
X1.1	4	13	90	70	23	3.48	3.55
X1.2	3	15	68	81	33	3.63	
X2.1	7	25	75	62	31	3.43	3.57
X2.2	5	13	60	78	44	3.72	
X3	15	32	87	49	17	3.11	
X4.1	5	18	85	73	19	3.42	3.74
X4.2	6	24	79	71	20	3.38	
X4.3	1	10	44	78	67	4.00	
X4.4	-	10	43	83	64	4.01	
X4.5	1	9	49	85	56	3.93	
X4.6	1	9	53	74	63	3.95	
X4.7	2	11	76	76	35	3.66	
X4.8	4	7	89	71	29	3.57	
X5.1	3	10	68	87	32	3.68	3.63
X5.2	2	6	49	91	52	3.93	
X5.3	6	13	45	81	55	3.83	
X5.4	1	17	75	69	38	3.63	
X5.5	2	13	77	74	34	3.63	
X5.6	16	31	74	53	26	3.21	
X5.7	3	21	78	65	33	3.52	
Y1	39	59	52	27	23	2.68	3.33
Y2	39	59	52	27	23	2.68	
Y3	4	8	78	92	18	3.56	
Y4	3	7	45	85	60	3.96	
Y5	4	8	56	92	30	3.78	

Source: Prepared by the author

Table 3. Regression test results

Model	Coefficient value	Probability value
F-test	67.654	0.001
T-test		
Vehicle quality (X1)	0.056	0.427
Travel speed (X2)	0.043	0.382
Terminal facilities (X3)	0.163	0.070
Service quality (X4)	0.218	0.001
Comfort and safety (X5)	0.106	0.001
Headway and frequency (X6)	0.028	0.670

Source: prepared by the author

The findings underscore that passenger satisfaction is contingent on service quality and comfort. Factors such as on-time performance, courteous staff, cleanliness, seating comfort, and a smooth ride are critical drivers of perceived accessibility and willingness to continue using AKDP services. Conversely, although deemed significant by

respondents, elements such as infrastructure and scheduling did not garner as high a degree of influence. In light of the findings, a series of strategic recommendations were formulated with the aim of enhancing service performance and passenger satisfaction. A more thorough exposition of these recommendations can be found in the subsequent discussion section of this paper.

4.2. Discussion

The results of this study offer critical insights into the performance of Intercity Public Transportation (Angkutan Kota Dalam Provinsi/AKDP) along the Samarinda–Balikpapan corridor, particularly in terms of its impact on regional accessibility. A thorough examination of the available data reveals a compelling conclusion. Among the assorted service attributes that were the focus of the statistical analysis, service quality and passenger comfort emerged as pivotal factors that substantially influence the perception of accessibility. This observation is further substantiated by the obtained p-values, notably below the 0.05 threshold. This finding lends further credence to the notion that intangible service factors are pivotal in enhancing user experience and promoting public transportation usage, a notion previously underscored in another study [7].

Despite the positive ratings for infrastructure-related variables, including bus quality, speed, terminal facilities, and headway/frequency, these variables did not demonstrate a statistically significant impact on accessibility in the regression model. This finding aligns with a broader trend suggesting that accessibility is not solely determined by physical infrastructure but also by the extent to which services meet the diverse expectations of passengers across socio-demographic groups [4]. The capacity of post-pandemic transportation systems to demonstrate resilience and satisfaction is contingent, to a considerable extent, on the adaptability of services and public perception rather than on infrastructure [9].

The analysis of vehicle quality (X1), travel speed (X2), and terminal quality (X3) as being merely "adequate" yet insignificant statistically suggests the underutilization of formal facilities. This phenomenon may be attributed to the pervasive use of informal boarding points, as evidenced by the observational data. Although such behavior may benefit passengers, it is detrimental to the effective functioning of transportation operations regulated by stakeholders. This is necessary to support the increasing demand for transportation services. This finding is consistent with others who have argued for implementing governance frameworks and collaboration between policymakers [10].

Notably, the comprehensive model accounts for 66.8% of the variability in accessibility perception, suggesting a robust correlation between the evaluated service factors and the outcomes of regional mobility. However, the minimal impact of operational parameters such as headway and frequency suggests that improvements in these aspects may not significantly shift public attitudes without concurrent upgrades in comfort and service interaction. The findings indicated that factors such as trust, alongside economic advantages and accessibility, represent key elements that improve customer satisfaction for online motorcycle taxi services [6].

From a strategic perspective, the study recommends several interventions: the integration of digital ticketing systems to streamline access and schedule transparency, the upgrading of in-vehicle facilities (e.g., air conditioning, seat quality, Wi-Fi), and the equipping of buses with GPS tracking for real-time operations monitoring.

In the broader context of East Kalimantan, particularly in light of the imminent relocation of Indonesia's capital to IKN, enhancing the efficiency and appeal of the AKDP route between Samarinda and Balikpapan is not merely a matter of convenience but rather a strategic necessity. As regional mobility demand intensifies, investment must move beyond infrastructure alone to embrace service quality and comfort as core drivers of sustainable public transportation. This is consistent with the urban equity approach [11], which emphasizes implementing customized strategies to assist low-income commuters by enhancing bus services in geographically dispersed regions.

5. Conclusion

The findings of this study indicate that the performance of intercity public transportation within provinces (AKDP), particularly on the Samarinda–Balikpapan route, plays a critical role in enhancing regional accessibility. The resultant analysis indicated that service quality and comfort are the only variables statistically impacting user-perceived accessibility. The policy implications of this research suggest that service enhancements should prioritize increasing scheduling reliability, improving vehicle and terminal conditions, providing onboard amenities (e.g., air conditioning, Wi-Fi, and ergonomic seating), and developing digital ticketing systems to ensure more efficient and accessible service. Furthermore, endeavors to eradicate unofficial pick-up points and unregulated ticketing practices will contribute to developing a more standardized and passenger-friendly system. By addressing these factors, stakeholders—including local governments and transport operators—can implement data-driven, user-oriented policies that strengthen public transportation's role in supporting sustainable urban mobility and regional development. The results of this study also provide a foundation for further research exploring broader dimensions of accessibility and transport equity in the context of growing urban regions in Indonesia.

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