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Analysis of the Influence of Public Transport Fleet on Regional Development through Community Accessibility and Road Connectivity in the City of Lhokseumawe

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Currently, a new concept in the transportation system has developed, namely a sustainable transportation system. The purpose of this research is to analyze the effect of the public transportation network system on community connectivity in Lhokseumawe City. The analytical method used in this research is a descriptive quantitative method using primary and secondary data. Quantitative descriptive is a type of research that is used to analyze data by describing or describing the data that has been collected as it is. This research uses multiple linear regression analysis tools. The results showed that the number of fleets, passenger capacity, routes had a

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positive and significant effect on the accessibility of the people in Lhokseumawe City. The number of fleets, passenger capacity and public transport routes have a positive and significant effect on community connectivity. The results of research on community accessibility and road transportation connectivity have a positive and significant effect on the development of the Lhokseumawe City area.

Keywords: Accessibility; transportation; community connectivity.

1. INTRODUCTION

Cities serve as habitats for a continuously growing population, meeting diverse needs in various activities. One crucial urban function is acting as a hub for service provision, production, and transportation networks within the surrounding regions (Bhudy Tjahyati Soegiyoko, 2005). The primary challenge faced by any city revolves around connectivity, encompassing both economic and social aspects [1]. Connectivity stands as a vital component in the growth and development of a city.

Transportation systems play a pivotal role as infrastructure for the movement of inhabitants, particularly through road networks. The road network system facilitates the distribution of goods and services, connecting various service hubs that function as centers of activity [2]. Additionally, transportation involves the relocation of objects, such as passengers, goods, animals, and more. Public transportation, which includes services like Cross-Border Transportation, Inter-City Transportation, City Transportation, Rural Transportation, Border Transportation, and Specialized Transportation, is utilized by the public and is fee-based [3,4].

Effective regulation and control are essential to ensure the safe, efficient, economical, secure, and comfortable transportation of these objects. The significance of transportation in human life is evident in its close relationship with lifestyle, the reach and location of productive activities, leisure, as well as available goods and services for consumption.

Human and goods movement from one place to another invariably follows specific pathways. The origin and destination are linked through a network in space, often represented by a road network (transportation infrastructure), a part of the transportation facility system. Transportation remains an enduring human necessity, and insufficient transportation routes due to population density can deter individuals from using their private vehicles. Ibrahim [5] asserts that the strength of interaction in a region is determined by road connectivity; the more roads connecting regions, the higher the connectivity, influencing the potential movement of people, goods, and services, as road infrastructure enhances regional accessibility and societal mobility.

This circumstance motivates public transportation services to continually evolve to meet user needs. Transportation involves the movement of people or goods from one place to another using vehicles powered by human or mechanical energy. Public transportation encompasses passenger transport through rental or fare-based systems, including city transport (buses, minibusses, etc.), trains, water transport, and air transport. A region's economic activities can develop more effectively with better transportation networks, leading to improved accessibility [6].

In his study (Rozaq, 2019), Rozaq explains that transportation plays a crucial role in facilitating individuals in moving objects from one location to another. Research by Junaidi et al. [7]. describes the primary role of an efficient transportation system as enabling people to easily access various facilities and services needed in daily life.

Transportation also contributes to reducing traffic congestion by optimizing road usage and introducing intelligent transportation solutions, such as mass transportation and advanced traffic management systems [8].

Based on transportation data for Lhokseumawe City, the city offers various types of public transportation, such as labi-labi or city transport, hiace inter-city transport, inter-city bus transport, and becak as intra-city transport. However, the residents of Lhokseumawe City prefer using private vehicles over existing public transportation, leading to the discontinuation of many public transport services [9].

This study aims to explore the reasons behind the preference for private transportation by

Lhokseumawe City residents and the influence of public transportation services on this choice. Specifically, it investigates the impact of fleet size, passenger capacity, and public transportation route efficiency on the accessibility of Lhokseumawe City residents. The study also examines the accessibility of residents and the road transport connectivity affecting the development of public transportation in the Lhokseumawe City region. The research aims to provide information to the Lhokseumawe City Government regarding the significant factors influencing residents' choice of private vehicles, contributing to traffic congestion, and the need for improvement in public transportation services [10].

2. METHOD

This study employed a nonprobability sampling technique with an incidental sampling method. The required data consisted of both primary data (gathered through questionnaires completed by labi-labi public transportation users in Lhokseumawe City) and secondary data (population figures for Lhokseumawe City, as well as theories from books and journals).

Data collection methods involved surveys (questionnaires), observations, and documentary studies. The data collection took place at the research site, namely Banda Sakti Subdistrict in Lhokseumawe City. The data analyzed utilized Multiple linear regression, and instrument data trials were conducted to test for validity and reliability. The variables to be examined include independent variables (X1, X2, X3) - the Number of Fleets, Passenger Capacity, and Route Trajectory - and dependent variables (Y1, Y2, Z) - Accessibility, Connectivity, and Regional Development. The analyzed formulated as follows:

$$Y1 = \beta 0 + \beta 1X1 + \beta 2X2 + \beta 3X3 + \mu$$

Where:

Y1 is the Accessibility of the community measured by the Number of people.
X1 represents the Number of Fleets (Quantity of Public Transport).
X2 signifies the Passenger Capacity (Number of People Per Public Transport).
X3 denotes the Route Trajectory (Number of Public Transport Routes)
$\beta 0$ is the constant term
μ stands for the error team.
$\beta 1 + \beta 2 + \beta 3$ are the regression cofficients.

Sampling was done incidentally, where anyone coincidentally encountering the researcher could become a sample. The research population included 100 community members and 5 labi-labi public transportation users in Lhokseumawe City. Data analysis employed quantitative descriptive analysis techniques, validity tests, reliability tests, and multiple regression tests.

Operational definitions of research variables included independent variables such as fleet size, passenger capacity, and routes/tracks, as well as dependent variables such as accessibility, connectivity, and regional development. The analysis aimed to evaluate the influence of these variables on the service network of public transportation routes in Lhokseumawe City.

3. RESULTS AND DISCUSSION

3.1 Research Location

Lhokseumawe City has attained autonomy, signifying its readiness to stand independently with sufficient capabilities, not only economically but also in terms of security. Over the past two years, security has become a paramount concern in the city due to its separation from North Aceh Regency to become an autonomous city since 2001.

Covering an area of 18,106 hectares, Lhokseumawe City is utilized for various community needs. The largest land use is for residential purposes, occupying 10,630 hectares (58.71%). Subsequently, it is used for rice fields with 3,943 hectares (21.78%), inland water cultivation and community plantations with 687 hectares (3.79%) and 674 hectares (3.72%), respectively. Additionally, there are 643 hectares (3.55%) of uncultivated scrub and bush. Lhokseumawe City is part of the Aceh Province, located between 04o 54o – 05o 18o N and on the line 96o 20o – 97o 21o E. The city covers approximately 181.06 square kilometers (km2) and shares administrative boundaries as follows:

- North: The Malacca Strait
- South: North Aceh (Kuta Makmur Subdistrict)
- West: North Aceh (Dewantara Subdistrict)
- East: North Aceh (Syamtalira Bayu

Subdistrict)

Administratively, Lhokseumawe City is divided into four districts: Banda Sakti, Muara Dua, Blang Mangat, and Muara Satu. These four districts encompass 9 urban areas and 68 villages.

3.2 Descriptive Analysis of Respondents

An instrument must undergo testing before being utilized to measure variables. Research instrument testing was conducted to assess the validity and reliability of the instrument in the study.

3.2.1 Descriptive characteristics of respondents

In this study, descriptive analysis provides a narrative or explanation of the primary data collected through questionnaires filled out by research participants, reflecting personal statements on the questionnaire. The characteristics under consideration include the identities of the respondents who filled out the questionnaire as samples in this study. These identities encompass gender, age, education, and occupation. Descriptive analysis is employed to obtain an overview of the respondents' identities or characteristics.

Based on the data in Table 1, the majority of respondents in this study are male, with 79 respondents (79.00%), compared to 21 female respondents (21.00%). Furthermore, the dominating age group is between 36 to 45 years, accounting for 76 respondents (76.00%). The least common highest education attainment among respondents is:

- Senior High School (SMA) with 10 individuals (10.00%),
- Followed by Junior High School (SMP) with 10 individuals (10.00%),
- Bachelor's degree (S1) with 71 individuals (71.00%),
- Diploma with 9 individuals (9.00%).

In terms of occupation, respondents include 12 laborers (12.00%), 58 entrepreneurs (58.00%), 18 civil servants (18.00%), and 12 others (12.00%).

3.2.2 Validity test

The validity test aims to assess the validity of each questionnaire item designed. A questionnaire item is considered valid if the correlation value (R count) of that item > R table (0.3494). Table. 2 presents the results of the validity test for each questionnaire item.

Based on Table 2 above, it can be observed that all statement items in the fleet size variable have R-count > R-table, indicating that all statement items in the fleet size variable are considered valid. This implies that all statement items in the fleet size variable can be understood by respondents and can be used for further analysis.

Table 1. Respondent characteristics data

Characteristics	Category	Quantity	Percentage %
	Male	79	79,00
Gender	Female	21	21,00
	Total	100	100
	17 – 25 years	9	9,00
Age	26 – 35 years	15	15,00
	36 – 45 years	76	76,00
	Total	100	100
	Junior High (SMP)	10	10,00
Education	Senior High (SMA)	10	10,00
	Diploma (D3)	9	9,00
	Bachelor’s (S1)	71	71,00
	Total	100	100
	Civil Servants	18	18,00
	Entrepreneur	58	58,00
Occupation	Laborer	12	12,00
	Others	12	12,00
	Total	100	100

Table 2. Validity Test Results for Fleet Size (X1)

Question Item	R-count	R-table	Status
P1	0.869	0,3494	Valid
P2	0.869	0,3494	Valid
P3	0.821	0,3494	Valid
P4	0.814	0,3494	Valid
P5	0.828	0,3494	Valid

Source: Processed Data 2023

According to Table 3, all statement items in the passenger capacity variable have R-count > R-table, indicating the validity of all statement items in the passenger capacity variable. Therefore, all statement items in the passenger capacity variable can be understood by respondents and can be used for further analysis.

As per Table 4, all statement items in the route track variable have R-count > R-table, indicating the validity of all statement items in the route track variable. Hence, all statement items in the route track variable can be understood by respondents and used for further analysis.

In Table 5, it is evident that all statement items in the accessibility variable have R-count > R-table, confirming the validity of all statement items in the accessibility variable. Therefore, all statement items in the accessibility variable can be understood by respondents and utilized for further analysis.

Table 6 illustrates that all statement items in the connectivity variable have R-count > R-table, signifying the validity of all statement items in the connectivity variable. Consequently, all statement items in the connectivity variable can be understood by respondents and employed for further analysis.

Table 3. Validity test results for passenger capacity (X2)

Question Item	R-count	R-table	Status
P1	0.800	0,3494	Valid
P2	0.857	0,3494	Valid
P3	0.841	0,3494	Valid
P4	0.855	0,3494	Valid
P5	0.847	0,3494	Valid

Source: Processed Data 2023

Table 4. Validity test results for route track (X3)

Question Item	R-count	R-table	Status
P1	0.813	0,3494	Valid
P2	0.832	0,3494	Valid
P3	0.849	0,3494	Valid
P4	0.869	0,3494	Valid
P5	0.862	0,3494	Valid

Source: Processed Data 2023

Table 5. Validity test results for accessibility (Y1)

Question Item	R-count	R-table	Status
P1	0.856	0,3494	Valid
P2	0.818	0,3494	Valid
P3	0.851	0,3494	Valid
P4	0.852	0,3494	Valid
P5	0.881	0,3494	Valid

Source: Processed Data 2023

Table 6. Validity test results for connectivity (Y2)

Question Item	R-count	R-table	Status
P1	0.850	0,3494	Valid
P2	0.849	0,3494	Valid
P3	0.828	0,3494	Valid
P4	0.798	0,3494	Valid
P5	0.846	0,3494	Valid

Source: Processed Data 2023

Based on Table 7, all statement items in the regional development variable have R-count > R-table, indicating the validity of all statement items in the regional development variable. Consequently, all statement items in the regional development variable can be understood by respondents and utilized for further analysis.

3.2.3 Reliability test

Reliability testing is conducted only for questions that have passed or fulfilled the validity test; if they do not meet the validity criteria, there is no need to proceed with the reliability test. Here are the results of the reliability test for the valid statement items.

Based on Table 8, the reliability test results for the fleet size variable show that the 5 statement items have a high reliability level, with a Cronbach's alpha value of 0.916. This indicates that the statement items in the fleet size variable are reliable since the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.916 > 0.6).

Table 9 demonstrates that the reliability test results for the passenger capacity variable indicate a high reliability level, with a Cronbach's alpha value of 0.926. Thus, the statement items in the passenger capacity variable are reliable, as the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.926 > 0.6).

According to Table 10, the reliability test results for the route track variable reveal a high reliability level, with a Cronbach's alpha value of 0.934. This signifies that the statement items in the route track variable are reliable, as the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.934 > 0.6).

Table 7. Validity test results for regional development (Z)

Question Item	R-count	R-table	Status
P1	0.840	0,3494	Valid
P2	0.840	0,3494	Valid
P3	0.839	0,3494	Valid
P4	0.837	0,3494	Valid
P5	*0.840*	*0,3494*	*Valid*

Source: Processed Data 2023

Table 8. Reliability test results for fleet size (X1)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Fleet Size	0,916	5	Reliable

Source: Processed Data 2023

Table 9. Reliability test results for passenger capacity (X2)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Passanger Capacity (X2)	0,926	5	Reliable

Source: Processed Data 2023

Table 10. Reliability test results for route track (X3)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Route Track (X3)	0,934	5	Reliable

Source: Processed Data 2023

Table 11 indicates that the reliability test results for the accessibility variable indicate a high reliability level, with a Cronbach's alpha value of 0.910. This implies that the statement items in the accessibility variable are reliable, as the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.910 > 0.6).

As per Table 12, the reliability test results for the connectivity variable illustrate a high reliability level, with a Cronbach's alpha value of 0.915. Consequently, the statement items in the connectivity variable are reliable, as the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.915 > 0.6).

Table 13 shows that the reliability test results for the regional development variable indicate a high reliability level, with a Cronbach's alpha value of 0.926. This implies that the statement items in the regional development variable are reliable, as the Cronbach's alpha value exceeds the minimum requirement of 0.6 (0.926 > 0.6).

3.3 Multiple Linear Regression Analysis

Multiple linear regression analysis aims to find the influence of two or more independent variables (X) on the dependent variable (Y). In this research, multiple linear regression analysis is used to determine the influence of independent variables including Fleet Size (X1), Passenger Capacity (X2), Route Track (X3), Accessibility (Y1), Connectivity (Y2), and Regional Development (Z) on the dependent variable Accessibility (Y1).

Based on the data in Table 14, which shows the results of multiple linear regression analysis in model 1, constant and regression coefficient values are obtained. This leads to the formulation of the multiple linear regression equation as follows:

$$Y1 = 1{,}962 + 0{,}342X1 + 0{,}509X2 + 0{,}116X3$$

Explanation:

- *Y*1: Accessibility
- *X*1: Fleet Size
- *X*2: Passenger Capacity
- *X*3: Route Track

The interpretation of the equation is as follows:

1. Constant (a) = 1.962: If the values of Fleet Size (X1), Passenger Capacity (X2), and Route Track (X3) are all 0, the Accessibility (Y) variable value is 1.962.
2. The regression coefficient value for Fleet Size (X1) is 0.342: For each increase in Fleet Size (X1) by 1 unit, with other variables constant, the Accessibility (Y1) variable will increase by 0.342. Since the coefficient is positive, there is a positive relationship between Fleet Size (X1) and Accessibility (Y1).
3. The regression coefficient value for Passenger Capacity (X2) is 0.509: For each increase in Passenger Capacity (X2) by 1 unit, with other variables constant, the Accessibility (Y1) variable will increase by 0.509. As the coefficient is positive, there is a positive relationship between Passenger Capacity (X2) and Accessibility (Y1).
4. The regression coefficient value for Route Track (X3) is 0.116: For each increase in Route Track (X3) by 1 unit, with other variables constant, the Accessibility (Y1) variable will increase by 0.116. Since the coefficient is positive, there is a positive relationship between Route Track (X3) and Accessibility (Y1).

Table 11. Reliability test results for accessibility (Y1)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Accessibility	0,910	5	Reliable

Source: Processed Data 2023

Table 12. Reliability test results for connectivity (Y2)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Connectivity	0,915	5	Reliable

Source: Processed Data 2023

Table 13. Reliability test results for regional development (Z)

Reliability Statistics			
Variable	**Cronbach's alpha**	**N of items**	**Status**
Regional Development (Z)	0,926	5	Reliable

Source: Processed Data 2023

Table 14. Multiple linear regression analysis model 1

Coefficients[a]						
Model		**Unstandardized Coefficients**		**Standardized Coefficients**	**T**	**Sig.**
		B	**Std. Error**	**Beta**		
1	(Constant)	1.962	4.306		.456	.650
	Fleet size (X1)	.342	.100	.308	3.421	.001
	Passenger City (X2)	.509	.099	.489	5.162	.000
	Route Track (X3)	.116	.105	.105	1.107	.271

a. Dependent Variable: Accessibility

Source: Processed Data 2023

Table 15. Analysis test results matrix

No	Research Model	Result
1	Fleet Size (X1) > Accessibility (Y1)	Significantly Influential Partially
2	Fleet Size (X1) > Connectivity (Y2)	Significantly Influential Partially
3	Fleet Size (X1) > Regional Development (Z)	Significantly Influential Partially
4	Passenger Capacity (X2) > Accessibility (Y1)	Significantly Influential Partially
5	Passenger Capacity (X2) > Connectivity (Y2)	Significantly Influential Partially
6	Passenger Capacity (X2) > Regional Development (Z)	Significantly Influential Partially
7	Route Track (X3) > Accessibility (Y1)	Significantly Influential Partially
8	Route Track (X3) > Connectivity (Y2)	Significantly Influential Partially
9	Route Track (X3) > Regional Development (Z)	Significantly Influential Partially
10	Accessibility (Y1) > Regional Development (Z)	Significantly Influential Partially
11	Connectivity (Y2) > Regional Development (Z)	Significantly Influential Partially
12	Fleet Size (X1), Passenger Capacity (X2), Route Track (X3) > Accessibility (Y1)	Significantly Influential Simultaneously
13	Fleet Size (X1), Passenger Capacity (X2), Route Track (X3) > Connectivity (Y2)	Significantly Influential Simultaneously
14	Fleet Size (X1), Passenger Capacity (X2), Route Track (X3) > Regional Development (Z)	Significantly Influential Simultaneously
15	Accessibility (Y1), Connectivity (Y2) > Regional Development (Z)	Significantly Influential Simultaneously

Table 16. Results of simultaneous test model 1

ANOVA[a]						
Model		**Sum ofSquares**	**Df**	**Mean Square**	**F**	**Sig.**
1	Regression	2415.921	3	805.307	43.001	.000[b]
	Residual	1797.869	96	18.728		
	Total	4213.790	99			
a. Dependent Variable: Accessibility						
b. Predictors: (Constant), fleet size, Passenger Capacity, Route Track						

Source: Data Processed 2023

3.4 Simultaneous Test (F Test)

The simultaneous test (F test) aims to determine the combined influence of independent variables on the dependent variable in a study. In this research, the simultaneous test aims to ascertain the influence of independent variables, including fleet size (X1), Passenger Capacity (X2), Route Track (X3), Accessibility (Y1), Connectivity (Y2), and Regional Development (Y)

Based on Table 16, the results of the simultaneous test (F test) indicate a significance value (*Sig.*) of 0.000, and the calculated F-value is 43.001. To determine the critical F-value, the degrees of freedom (*df*) are considered, which is calculated as follows: $df1{:}1{:}n-k-1(100-2-1)=97$. From this calculation, the critical F-value is obtained as 3.09.

Since the calculated F-value (43.001) is greater than the critical F-value (3.09), it implies that the fleet size, Passenger Capacity, and Route Track significantly influence Accessibility simultaneously. Therefore, the simultaneous effect of these independent variables on the dependent variable (Accessibility) in the transportation development in the city of Lhokseumawe is statistically significant. This result suggests that an increase in Fleet Size, Passenger Capacity, and Route Track by a unit will collectively contribute to a 43.001-unit increase in Accessibility in a simultaneous manner.

3.5 Analysis of the Public Transportation Network System on Community Connectivity in Lhokseumawe City

1. **Importance of Transportation:** This research emphasizes the significance of transportation in daily life and developmental progress. Transportation is considered the lifeblood of the economy, supporting various aspects of community life.
2. **Influence of Fleet Size on Accessibility:** The study reveals that the number of transportation fleets significantly affects the community's accessibility in Lhokseumawe City. A larger fleet enhances service coverage, improving comfort, safety, and reducing travel time.
3. **Integration of Public Transportation Systems:** The integration of public transportation systems involves closer interaction among elements serving different transportation modes. This integration aims to enhance service quality and overall performance of public transportation.
4. **Passenger Capacity and Route Track Impact on Accessibility:** Both passenger capacity and route track significantly influence accessibility. Effective increases in passenger capacity and well-planned route tracks can enhance public transportation accessibility.
5. **Influence of Fleet Size, Passenger Capacity, and Route Track on Connectivity:** The research suggests that fleet size, passenger capacity, and route track have a significant impact on connectivity. The addition of terminals is also considered to enhance connectivity and accessibility of public transportation.
6. **Interconnection of Accessibility and Connectivity with Regional Development:** Both accessibility and connectivity of public transportation have a substantial impact on regional development. Improved accessibility and connectivity can support economic growth, human resource development, optimal land use, and environmental protection.
7. **Role of Transportation Infrastructure in Connectivity:** Developing transportation infrastructure is crucial for achieving connectivity and supporting economic growth. Collaboration between the central government, local authorities, and other stakeholders is essential to ensure optimal

implementation of transportation infrastructure development programs.

This research provides a comprehensive overview of the interaction between various factors in the public transportation system and their impact on accessibility, connectivity, and regional development in Lhokseumawe City.

3.6 Interconnection of the Transportation Network System with Regional Development

1. **Transportation Demand as a Driving Force for Regional Development:** The initiation of transportation service development is driven by demand from other sectors, known as derived demand. This is done to meet the effective and efficient transportation service needs that support regional development.
2. **Role of the National Transportation System (SISTRANAS) in Regional Development:** The National Transportation System (SISTRANAS) plays a central role in regional development. Effective and efficient transportation services are organized within the framework of SISTRANAS, helping to integrate and coordinate various transportation aspects to support regional development.
3. **Regional Systems and SWP:** Regional development is regulated in a regional system consisting of Development Regional Units (Satuan Wilayah Pembangunan or SWP). SWPs have hierarchically organized centers, each with influence areas. The transportation network connects these centers, creating a framework that supports interaction and regional growth.
4. **Interactive and Supportive Two-way Interaction:** The relationship between transportation and regional development is interactive and supportive. An efficient transportation system facilitates connectivity between regions, supports economic sector growth, increases employment, and enhances community welfare.
5. **Transportation Facilities as the Leading Sector:** Transportation facilities are considered a leading sector with a strategic role. As a leading sector, transportation drives the development of leading commodities and sectors by leveraging comparative advantages.
6. **Positive Contribution to Regional Development:** Future transportation advancements are expected to have a positive impact on regional development. Improvements in speed, load capacity, infrastructure networks, accessibility, and human and cargo mobility are expected to contribute positively to regional growth and development.

Understanding the interconnection between the transportation network system and regional development is crucial for designing policies that support economic growth, increased employment, and holistic community welfare.

4. CONCLUSION AND RECOMMENDATIONS

The analysis of the public transportation network system in Lhokseumawe City indicates that the number of fleets, passenger capacity, and route tracks significantly influences the accessibility and connectivity of the community. Stringent regulations on fleet numbers, aligned with the basic needs of the community, and the optimization of capacity and route tracks are key to improving the effectiveness of public transportation services in this city. Furthermore, road accessibility and connectivity also play a role in regional development, providing positive impacts on employment, per capita income, and community welfare.

The government recognizes the strategic role of public transportation in improving community welfare. Priority for performance improvement should focus on enhancing transportation network connectivity while considering accessibility and service quality aspects. Efforts to optimize wait times, precise scheduling, and expanded operating hours will improve both accessibility and the efficiency of public transportation services. Additionally, public vehicle stops need to be strategically placed, considering user needs, maintaining proximity to the origin and destination of travel to enhance time efficiency and user comfort. The implementation of these recommendations is expected to contribute positively to the development of transportation infrastructure and the welfare of the community in Lhokseumawe City.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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