ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

Analysis of the Performance of the City Transport Route Network System (AKDP) in Gorontalo Province, Indonesia

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Abstract:- This study evaluates the performance of the intercity public transportation route network system (AKDP) in Gorontalo Province, Indonesia, with a focus on aspects of service coverage, overlap, density, and route network deviations. Data were obtained through field surveys. The research method includes spatial analysis using Geographic Information Systems (GIS) to evaluate the coverage and distribution of routes, as well as statistical analysis to measure the density and ratio of routes based on operational data and field surveys. The research results show that the coverage of route services is not yet even, with some areas being underserved. Route overlaps were identified on several main corridors, resulting in operational inefficiencies. The density of the routes shows significant variation, with some routes experiencing overcrowding while others are underutilized. The route ratio also shows an imbalance between the number of vehicles and passenger needs. Deviations from the established route plan were also found, which could potentially reduce service reliability. Based on these findings, it is recommended to restructure the route network and improve operational management to enhance the efficiency and quality of transportation services in Gorontalo Province.

Keywords:- *Service Coverage, Overlapping Routes, Route Density, Route Deviations, Gorontalo Indonesia*

I. INTRODUCTION

Public transportation plays an important role in supporting community mobility and fostering economic growth in various regions, including Gorontalo Province. As a continuously developing province, the need for an efficient and reliable transportation system is becoming increasingly important. City-to-Province Transportation (AKDP) is one of the main modes of transportation connecting various areas in Gorontalo Province, from the city center to rural regions [1]. The AKDP service not only facilitates the movement of residents but also serves as the backbone of economic activities, especially in connecting trade, education, and healthcare centers.

However, despite AKDP playing a strategic role, there are several significant challenges in managing its route network. One of the main issues is the imbalance in route distribution. Some areas, especially rural and suburban regions, have limited access to AKDP services, while certain routes in urban areas experience overcrowding and high density. This imbalance causes problems in accessibility, where residents in underserved areas face difficulties in accessing public services and economic opportunities.

Additionally, route overlap is a common issue found in the main corridors. This overlap occurs when several routes serve the same or nearly the same path, leading to competition among operators and inefficiency in fleet usage. This condition not only reduces operational effectiveness but can also cause confusion among passengers.

Another issue is the deviation of the route from the planned itinerary. These deviations often occur due to factors such as traffic congestion, poor road conditions, or operator decisions aimed at optimizing revenue. However, these deviations can reduce service reliability, increase travel times, and cause dissatisfaction among passengers [2].

The operational efficiency of AKDP services in Gorontalo Province is greatly influenced by these factors. The imbalance in route distribution, overlaps, and route deviations all contribute to increased operational costs, decreased service quality, and ultimately, reduced user satisfaction. Therefore, a comprehensive evaluation of the AKDP route network system is necessary to identify these issues and formulate improvement strategies to enhance public transportation performance in Gorontalo Province.

II. RESEARCH METHOD

This study uses a combination approach of spatial and statistical analysis to evaluate the performance of the City Transport Inter-Province (AKDP) route network system in Gorontalo Province. This method is designed to provide a comprehensive overview of service coverage, overlap, density, passenger-to-capacity ratio, and route deviations [3]. The methodology process is described as follows:

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

A. Research Location and Time

➢ *Research Location*

This research was conducted in Gorontalo Province, which is one of the provinces in Indonesia with various geographical and demographic characteristics that influence public transportation dynamics. The research locations include the following areas:

- *City of Gorontalo*

As the provincial capital, the city of Gorontalo is a center of economic, governmental, and educational activities. Research in this area focuses on AKDP routes that serve intra-city and surrounding routes, which often have high passenger density.

- *Gorontalo Regency*

This area was chosen to understand how the AKDP routes serve a wider and more rural region compared to Gorontalo City. The focus is on the routes that connect villages with the district center and Gorontalo City.

- *Bone Bolango Regency*

Research in this area aims to evaluate the coverage of AKDP services in more remote and underserved regions. The analysis will include routes connecting rural areas with major activity centers.

- *Gorontalo Utara Regency, Boalemo Regency end Pohuwato Regency*

These regencies were chosen to provide a broader view of the coverage and distribution of AKDP routes throughout the province. The focus of the research in this area is to identify route overlaps and measure service effectiveness in more remote areas.

Administratively, the research location is shown in the Figure 1 [1].

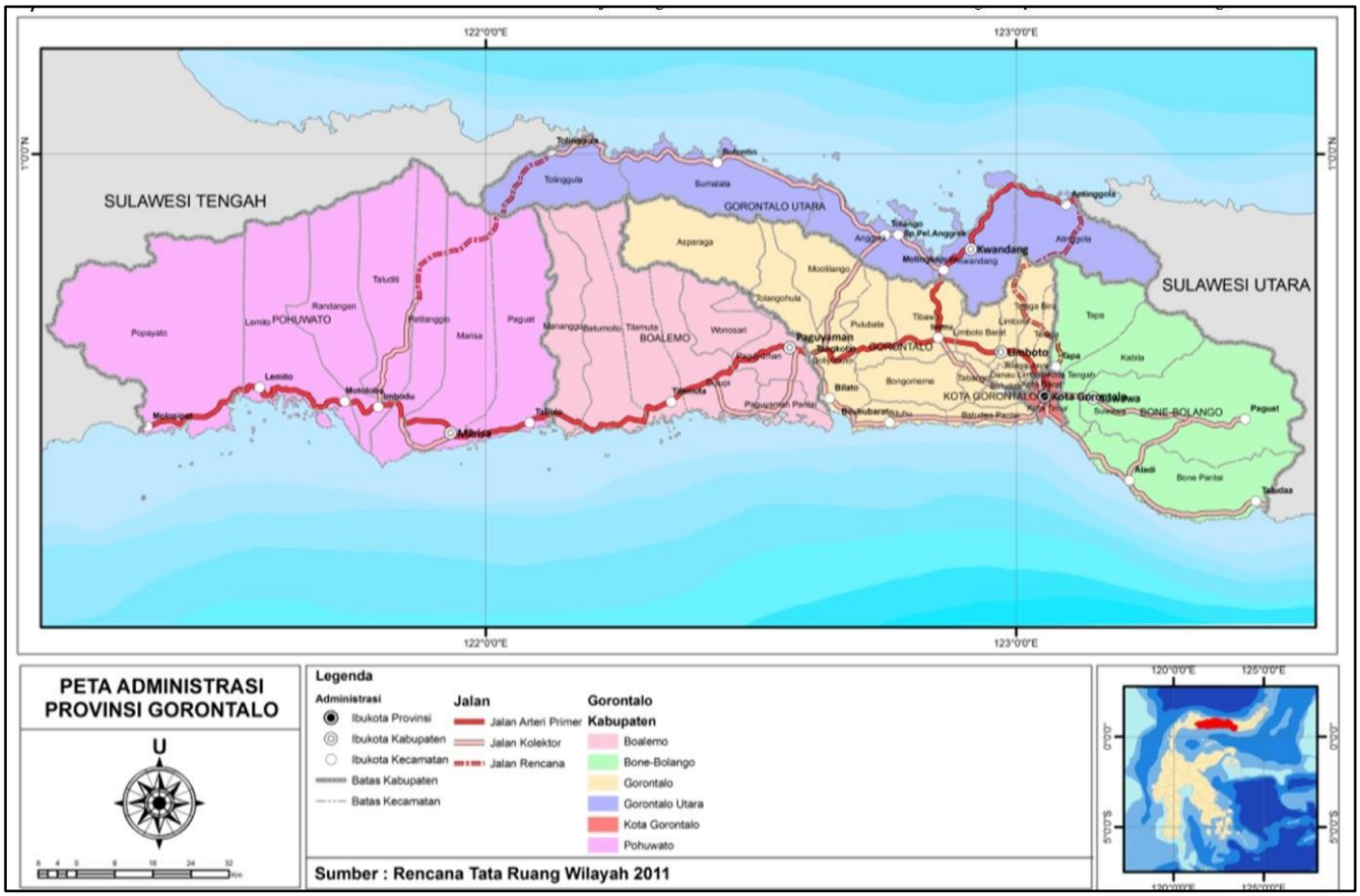

Fig 1: Administrative Map of Gorontalo Province

➢ *Research Time:*

This research was conducted over a six-month period, from January to June 2024, divided into several stages, from data collection to analysis and final report preparation.

- Preparation Stage (Month 1) In this stage, administrative preparations are made, coordination with related parties such as the Gorontalo Provincial Transportation Agency, and the development of research instruments such as survey questionnaires and route network maps that will be used in spatial analysis.

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- Data Collection (Months 2-3) Field data collection is conducted over two months, involving surveys of AKDP service users, interviews with drivers and route operators, as well as the collection of GPS data from the transport fleet. Direct observations were conducted to record passenger density, travel time, and route deviations.
- Data Analysis (Months 4-5) The collected data was analyzed using GIS software for spatial analysis and statistical software for descriptive, correlation, and regression analysis. Analysis was conducted to identify the main issues in the AKDP route network, such as overlaps, imbalances in the passenger-to-capacity ratio, and route deviations.
- Preparation of Report and Recommendations (Month 6) In the final month, the research report is prepared, which includes key findings, analysis, and recommendations for improving the performance of the AKDP route network in Gorontalo Province. This report will then be discussed with relevant parties to obtain input and considerations before being presented as the final research outcome.

B. Population and Sampling

➢ *Population*

The population in this study includes all routes of Urban Transport Within the Province (AKDP) operating in Gorontalo Province as well as AKDP service users. This population consists of two main groups. The steps for sampling are as follows:

- AKDP Routes: The population of routes includes all registered and active AKDP operational routes in Gorontalo Province. This includes routes serving intercity connections within the province, both linking urban and rural areas. Data regarding the total number of routes was obtained from the Gorontalo Provincial Transportation Agency.
- AKDP Service Users: The user population includes all passengers who use the AKDP service in Gorontalo Province during the research period. These service users vary from daily passengers who routinely use AKDP for work or school commutes, to passengers who use AKDP for occasional needs.

➢ *Sampling*

This research uses sampling techniques to obtain representative data from the population. Two sampling techniques used are purposive sampling for AKDP routes and random sampling for AKDP service users [4].

- *Purposive Sampling for AKDP Routes: The Purposive Sampling Technique is used to Select Routes that will be Analyzed in Depth. The Selection of Routes is based on Specific Criteria, Such as:*

✓ Purposive Sampling for AKDP Routes: The purposive sampling technique is used to select routes that will be analyzed in depth. The selection of routes is based on specific criteria, such as.
✓ Coverage Area: Routes serving urban and rural areas were selected to observe variations in service coverage.
✓ Operational Frequency: Routes with varying operational frequencies were selected for a more comprehensive analysis.

From the total population of routes, a sample of 30% [5] of the total operating routes was taken, ensuring representation from various established criteria.

- *Random Sampling for AKDP Service Users: To Obtain Representative Data from Service Users, the Random Sampling Technique was used. This Study Conducted Surveys of Passengers at Various Stops and During the Journey on the Route Selected through Purposive Sampling.*

✓ Sample Size: Using the Slovin formula with a 5% margin of error [6], the required sample size to obtain representative results is determined. For example, if the total passenger population is estimated to be 10,000 people, then the minimum sample required is around 385 respondents.

Passengers randomly selected during the journey and at major stops on each route provide data related to their experience using the AKDP service, including satisfaction, frequency of use, and perceptions of regularity and comfort.

Table 1: Calculation of AKDP Vehicle Sample Size

No.	Code	Route with Round Trip	Population AKDP	Minimum Sample Size AKDP
1.	(AB-05)	Gorontalo Regency, route Dungingi Terminal-Limboto Terminal-Isimu Terminal	38	8
2.	(AA-01)	Gorontalo City, route Gorontalo City Center Terminal-Iluta-Batudaa-Bongomeme Terminal	190	10
3.	(AB-01)	North Gorontalo Regency, route Dungingi-Kwandang Terminal (Via Isimu Terminal)	112	10
4.	(AB-02)	Boalemo Regency, route Dungingi-Tilamuta (Via Isimu Terminal)	89	10
5.	(AB-06)	Pohuwato Regency, route Dungingi-Marisa (Via Isimu Terminal)	56	9
6.	(AC-01)	Bone Bolango Regency, route Leato Terminal-Bonepantai-Taludaa	2	2
Total Length			**487**	**49**

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

Fig 2: Random Sampling of AKDP Service Users

C. Validity and Reliability

To ensure that the data collected represents the population and is reliable, validity and reliability testing is conducted [7].

- Content Validity: Ensure that the survey questions cover all aspects relevant to the research.
- Reliability: Reliability testing using Cronbach's Alpha to ensure the internal consistency of the survey questionnaire.

III. RESULTS AND DISCUSSION

The context of the research on the coverage of the urban public transportation network routes (AKDP) in Gorontalo Province has received significant attention from the Gorontalo government. The optimization of this transportation service requires an in-depth understanding of the extent to which the coverage of these routes is evenly distributed across the Gorontalo Province. Administratively, Gorontalo Province consists of 5 regencies and 1 city, with 33 AKDP network routes. The layout of the 5 regencies and 1 city, along with the 33 AKDP network routes, is shown in Figure 2 [8].

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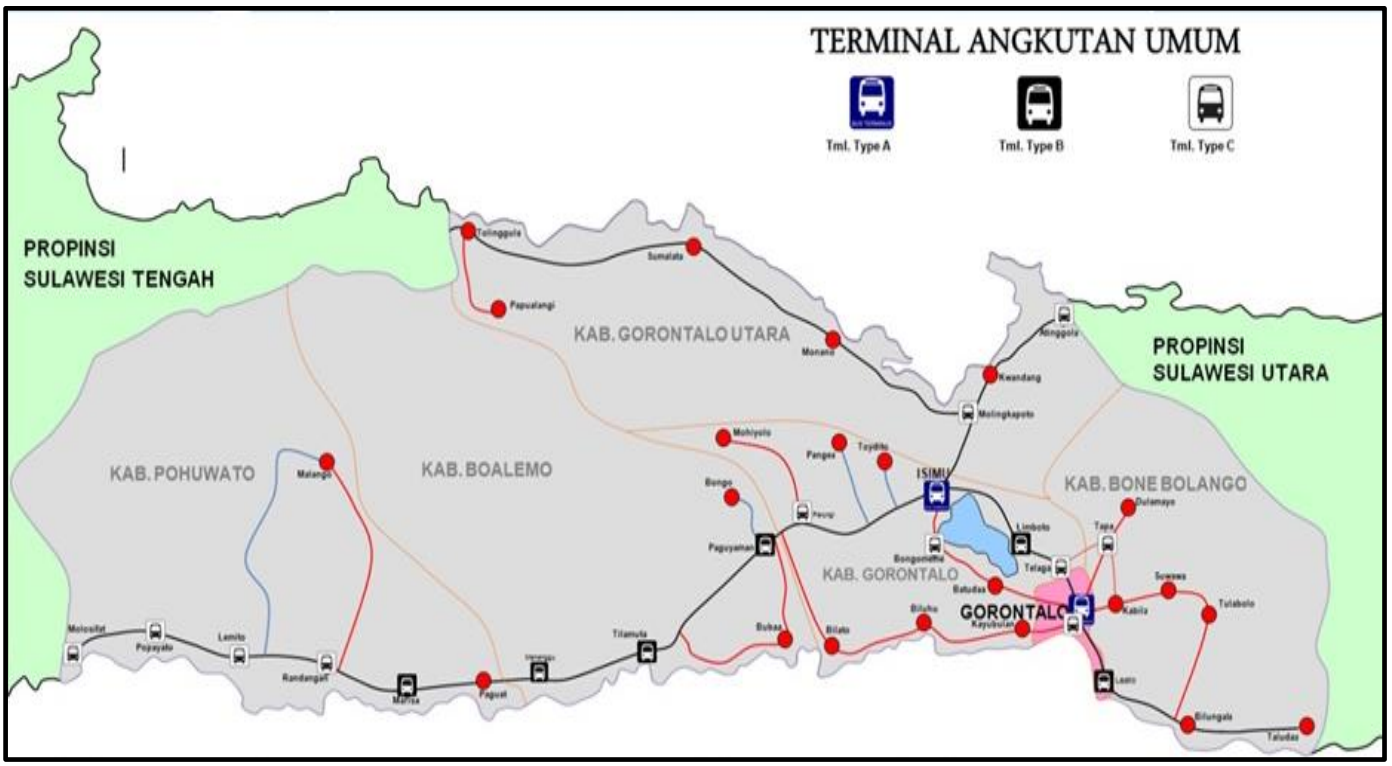


Fig 3: AKDP Transport Route Network Map for Gorontalo Province

A. Analysis of the Service Coverage of Intra-Provincial City Transport Routes (AKDP) in Gorontalo Province

➢ *Based on the Route Length and Standard Stop Distance*

The standard service coverage of public transportation routes is calculated based on the walking distance of AKDP users, not the distance between service routes, but the distance between stops (Terminals or Haltes) from AKDP users in several nearby sub-districts. The service network is considered good if 70% to 75% of the population lives 400 meters or more from the stop, and if 50% to 60% of the population lives 800 meters or more from the stop (Terminals or Haltes)

Based on the results of field surveys in various administrative regions of the research area, the following was obtained:

Table 2: Coverage of Route Network Services Based on Route Length and AKDP Stop Distance Standards

No.	Code	Standard Bus Stop Distance (Km)	Route Length (Km)	Scope of Services (Km^2)
	(a)	(b)	(c)	(d) = (c)*(b)
1	AA-01	0,8	26	20,8
2	AA-02	0,8	17	13,6
3	AA-03	0,8	14	11,2
4	AA-04	0,8	13	10,4
5	AA-05*	0,8	23	18,4
6	AA-06	0,8	27	21,6
7	AB-01	0,8	63	50,4
8	AB-02	0,8	104	83,2
9	AB-03	0,8	102	81,6
10	AB-04	0,8	71	56,8
11	AB-05	0,8	30	24
12	AB-06	0,8	164	131,2
13	AB-07	0,8	114	91,2
14	AB-08	0,8	194	155,2
15	AB-09	0,8	79	63,2
16	AB-10	0,8	85	68
17	AB-11	0,8	220	176
18	AB-12	0,8	259	207,2
19	AB-13	0,8	251	200,8
20	AB-14	0,8	46	36,8

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

No.	Code	Standard Bus Stop Distance (Km)	Route Length (Km)	Scope of Services (Km^2)
	(a)	(b)	(c)	(d) = (c)*(b)
21	AB-15	0,8	205	164
22	AB-16	0,8	105	84
23	AB-17	0,8	80	64
24	AB-18	0,8	50	40
25	AB-19	0,8	18	14,4
26	AB-20	0,8	56	44,8
27	AB-21	0,8	63	50,4
28	AC-01	0,8	64	51,2
29	B-01	0,8	134	107,2
30	B-02	0,8	212	169,6
31	B-03	0,8	33	26,4
32	B-04	0,8	72	57,6
33	B-05	0,8	175	140
Total Length			3169	2636

➢ *Based on Route Length and Willingness to Walk*

Theoretically, the willingness to walk (0.4 to 0.8 km) from either the right or left side of the route constitutes the service coverage area of the route. If the overlapping route is counted only once, the route length used in this service coverage calculation is the total route length that passes through the zone. Based on the results of the questionnaire distributed in various administrative regions of the research area, the following was obtained:

Table 3. Coverage of Route Network Services Based on AKDP Route Length and Willingness to Walk

No	Code	The Will of the Walking People (Km)	Route Length (Km)	Scope of Services (Km^2)
	(a)	(b)	(c)	(d) = (c)*(b)
1	AB 05	2	28.1	56.2
2	AA 01	2	27.6	55.2
3	AB 01	2	63	126
4	AB 02	2	106	212
5	AB 06	2	163	326
6	AC 01	2	64.3	128.6
Total Length			461	913

B. Analysis of Overlapping Routes of Intercity Public Transportation (AKDP) in Gorontalo Province

➢ *The Level of Overlap in Routes in Gorontalo Regency (AB-05).*

This route often overlaps from Limboto terminal to Isimu terminal. Usually, this happens either by agreement or outside the agreement of the angkot drivers, so it can sometimes cause conflicts due to competition for passengers and operational areas.

➢ *The Level of Route Overlap in Gorontalo City (AA-01).*

This route often overlaps from the Iluta-Batudaa terminal, Batudaa-Bongomeme, Batudaa-Iluta, Iluta-Central city terminal (Tml. Batudaa-Bongomeme), which is the central city terminal. Usually, this happens either by agreement or outside of the agreement among the angkot drivers, so it can sometimes cause conflicts due to competition for passengers and operational areas.

➢ *The Level of Route Overlap in North Gorontalo Regency (AB-01).*

This route often overlaps from the Isimu-Kwandang terminal. Usually, this happens either by agreement or outside the agreement of the angkot drivers, so it can sometimes cause conflicts due to competition for passengers and operational areas.

➢ *The Level of Route Overlap in Boalemo Regency (AB-02)*

This route often overlaps from the Isimu-Paguyaman terminal to the Paguyaman-Tilamuta terminal. Usually, this happens either by agreement or outside the agreement of the angkot drivers, so it can sometimes cause conflicts due to the competition for passengers and operational areas.

➢ *The Level of Overlap in Routes in Pohuwato Regency (AB-06).*

This route often overlaps from the Isimu-Paguyaman terminal, Paguyaman-Tilamuta terminal, Tilamuta-Paguat terminal, Paguat-Marisa terminal. Usually, this happens either by agreement or outside of the agreement among the angkot drivers, so it can sometimes cause conflicts due to competition for passengers and operational areas.

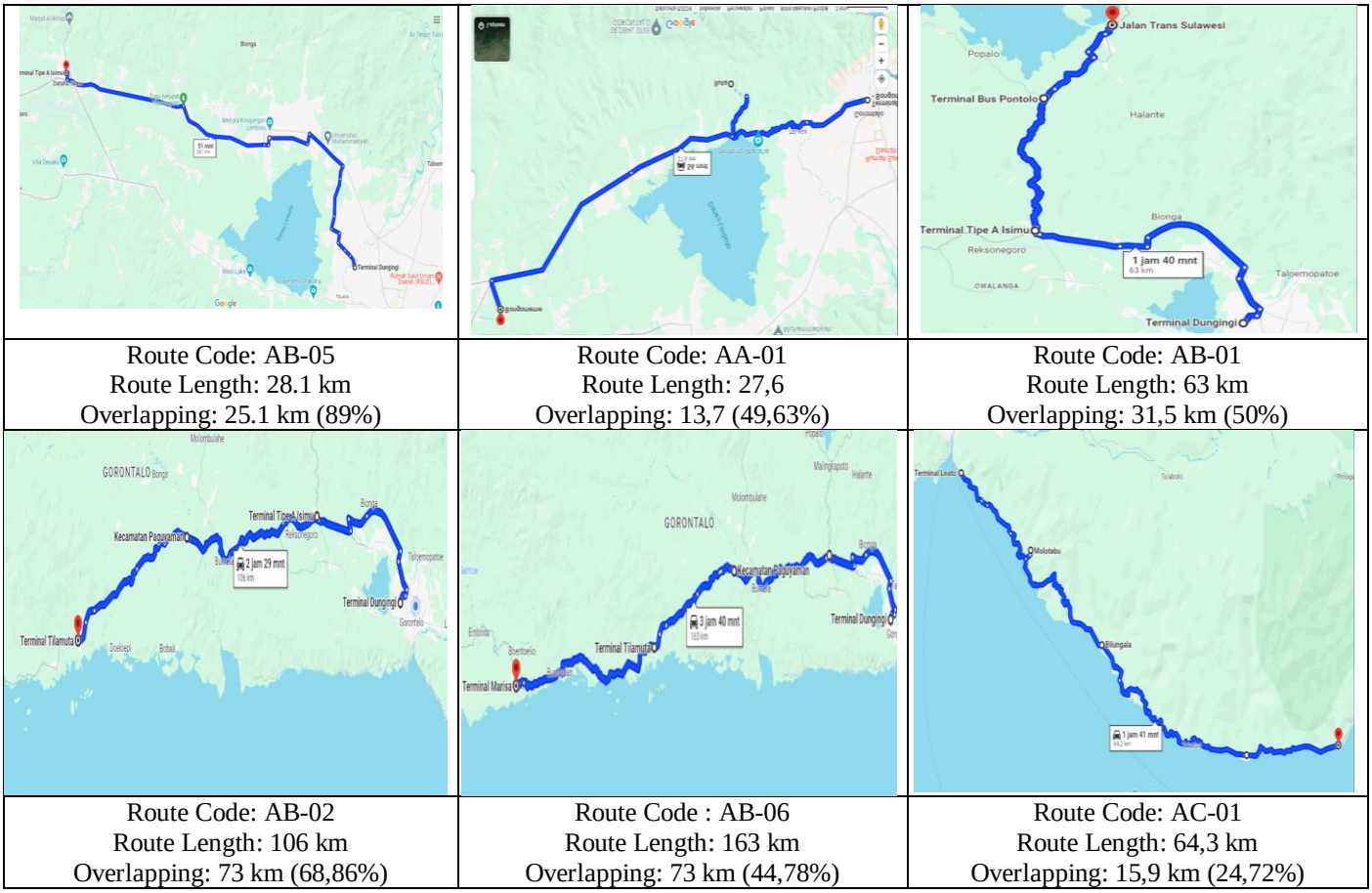
➢ *The Level of Overlap in Routes in Bone Bolango Regency (AC-01).*

This route only has 2 vehicles operating according to its sample in this area. this route starts from Terminal Leato heading to Taludaa, which is located in the Boneraya District, Bone Bolango Regency. This route also passes through Molotabu, Bilungala, which are passenger pickup

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

points. However, overlaps also sometimes occur due to transportation deviating from its operational area and sometimes because of village transportation. The level of overlap happens either by agreement or outside the agreement of the angkot drivers, which can sometimes cause conflicts due to competition for passengers and operational areas.

Spatially, the results of the analysis of overlapping AKDP routes that occurred in Gorontalo Province are as follows:



Route Code: AB-05 Route Length: 28.1 km Overlapping: 25.1 km (89%)	Route Code: AA-01 Route Length: 27,6 Overlapping: 13,7 (49,63%)	Route Code: AB-01 Route Length: 63 km Overlapping: 31,5 km (50%)
Route Code: AB-02 Route Length: 106 km Overlapping: 73 km (68,86%)	Route Code : AB-06 Route Length: 163 km Overlapping: 73 km (44,78%)	Route Code: AC-01 Route Length: 64,3 km Overlapping: 15,9 km (24,72%)

Fig 4: Results of Spatial Overlap Analysis of AKDP Route Network in Gorontalo Province

Based on the image 4 above, it can be seen that the overlap occurs mainly on the main public transportation corridors in urban areas. The data presented includes the length of the routes, the routes involved, and the percentage of overlap. It was found that several routes, such as AB-05, AB-02, and AB-06, have very high overlap rates, reaching 89.87%, 68.86%, and 44.78%, respectively. This overlap can cause conflicts among AKDP drivers due to competition for passengers and operational areas. This indicates the need for better management in the regulation of AKDP routes to reduce overlap and potential conflicts.

C. Analysis of Density and Route Ratio of Intercity Public Transportation (AKDP) in Gorontalo Province

The density of the routes was uncertain during the observation. To obtain accurate data regarding the density in each route zone, questionnaires were distributed to passengers in various zones in each district in Gorontalo Province. The division of zones is based on the administrative regions of sub-districts, taking into account land use aspects and road networks. From this division, the study area is ultimately divided into 22 zones arranged according to sub-district administration and land use.

In theory, route density can be calculated based on the comparison of the length of routes traversed by AKDP with the area of the case zone in Gorontalo Province. The results of the AKDP route network density analysis in Gorontalo Province are shown in Table 4, where the total length of the route network traversed by public transportation is 664.5 km, with an average route density of 20.98%. Meanwhile, the results of the Urban Transport Density Ratio (AKDP) analysis in Gorontalo Province are shown in Table 5.

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Table 4: Density of AKDP Route Network in Gorontalo Province

Zone	Sub District	Land Use Pattern	Area (Km^2)	Route Length (Km)	Route Density (%)
1	Kota Timur	Offices, Shopping, Retail, Hospitality, Education, Trade, Residential, Worship	5.13	3.00	58.48
2	Telaga Biru	Offices, Shopping, Retail, Hospitality, Education, Trade, Residential, Worship	109.08	10.00	9.17
3	Limboto	Offices, Terminal, Government Center, Shopping, Education, Trade, Residential, Worship	72.45	15.70	21.67
4	Wonosari	Office, Shopping, Education, Trade, Residential, Worship	229.61	19.10	8.32
5	Marisa	Offices, Terminal, Government Center, Shopping, Education, Trade, Residential, Worship	34.65	6.80	19.62
6	Tibawa	Offices, Airport, Terminal, Shopping, Education, Trade, Residential, Worship	155.26	67.90	43.73
7	Tapa	Office, Shopping, Education, Trade, Residential, Worship	13.43	13.20	98.29
8	Kota Tengah	Office, Shopping, Education, Trade, Residential, Worship	4.82	3.20	66.39
9	Sumalata Timur	Settlement, Vegetable Farming, Forestry, Mountains, Industry	156.78	29.60	18.88
10	Pulubala	Offices, Shopping, Education, Trade, Residential, Worship, Industry	225.51	73.00	32.37
11	Dungalio	Offices, Shopping, Education, Trade, Residential, Worship, Industry	51.05	13.90	27.23
12	Pauwo	Office, Shopping, Education, Trade, Residential, Worship	206.72	103.00	49.83
13	Tulangohula	Office, Shopping, Education, Trade, Residential, Worship	5.93	3.20	53.96
14	Bongomeme	Office, Shopping, Education, Trade, Residential, Worship	458.41	22.50	4.91
15	Tilango	Office, Shopping, Education, Trade, Residential, Worship	501.85	57.60	11.48
16	Lemito	Offices, Education, Residential, Worship, Dock, Agriculture	148.13	29.60	19.98
17	Buntulia	Offices, Education, Residential, Worship, Agriculture, Industry	360.87	57.60	15.96
18	Angrek	Office, Education, Settlement, Worship, Agriculture	151.91	17.70	11.65
19	Dengilo	Education, Settlement, Worshi	170.15	73.00	42.90
20	Bone	Office, Shopping, Education, Settlement	104.35	44.90	43.03
Total Amount			3160,15	664,50	20.99

Table 5: Ratio of AKDP Route Network Density in Gorontalo Province

Code	Zones traversed	Area (km^2)	Route length (Km)	Route network density ratio per zone (Km/Km^2)	Total Density Ratio (Km/Km^2)
AB-05	1	5.13	3	0.58	3.52
	7	13.43	13.2	0.98	
	8	4.82	3.2	0.66	
	2	109.08	10	0.09	
	3	72.45	15.7	0.22	
	6	155.26	67.9	0.44	
	13	5.93	3.2	0.54	
AA-01	1	5.13	3	0.58	7.01
	7	13.43	13.2	0.98	
	8	4.82	19.1	3.96	
	6	155.26	67.9	0.44	
	12	206.72	103	0.50	
	13	5.93	3.2	0.54	
AB-01	1	5.13	3	0.58	3.69

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Code	Zones traversed	Area (km²)	Route length (Km)	Route network density ratio per zone (Km/Km²)	Total Density Ratio (Km/Km²)
	7	13.43	13.2	0.98	
	8	4.82	3.2	0.66	
	2	109.08	10	0.09	
	3	72.45	15.7	0.22	
	6	155.26	67.9	0.44	
	9	156.78	29.6	0.19	
	10	225.51	73	0.32	
	16	148.13	29.6	0.20	
AB-02	1	5.13	3	0.58	3.81
	7	13.43	13.2	0.98	
	8	4.82	3.2	0.66	
	2	109.08	10	0.09	
	3	72.45	15.7	0.22	
	6	155.26	67.9	0.44	
	10	225.51	73	0.32	
	19	170.15	73	0.43	
	4	229.61	19.1	0.08	
AB-06	1	5.13	3	0.58	4.14
	7	13.43	13.2	0.98	
	8	4.82	3.2	0.66	
	2	109.08	10	0.09	
	3	72.45	15.7	0.22	
	6	155.26	67.9	0.44	
	10	225.51	73	0.32	
	19	170.15	73	0.43	
	4	229.61	19.1	0.08	
	17	360.87	57.6	0.16	
	15	501.85	57.6	0.11	
	14	458.41	22.5	0.05	
AC-01	1	5.13	3	0.58	1.13
	20	104.35	44.9	0.43	
	18	151.91	17.7	0.12	

D. Analysis of Route Deviations of Intercity Within Province Public Transport (AKDP) in Gorontalo Province

Based on the observation of the existing conditions, the level of route deviation is quite high, compounded by the irregular performance system of the urban transportation route network within the province (AKDP).

➢ *Route Deviation on the Route in Gorontalo Regency (AB-05)*

Route AB-05 has a length of 28.1 km. This route starts from Dungingi Terminal and ends at Isimu Type A Terminal. This route also transits at Limboto Terminal. Deviations often occur on this route from Limboto Terminal to Isimu Terminal. Usually, this can cause several conflicts due to competition for passengers and operational areas.

➢ *Deviation on the Route in Gorontalo City (AA-01)*

The length of the route (AA-01) is 27.6 km. This route starts from Terminal Batudah Bongomeme on Jalan Raja Eyato and ends at Terminal Bongomeme. This route also passes through Iluta Village, where passengers are picked up. This route often experiences deviations from several terminals that have connections to destinations that are not too far away. Usually, this can cause some conflicts due to competition for passengers and operational areas.

➢ *Route Deviations on the Route in North Gorontalo Regency (AB-01)*

The length of the route (AB-01) is 63 km. This route starts from Dungingi Terminal and goes to the Kwandang area in North Gorontalo Regency. This route also passes through Isimu Terminal and Pontolo Bus Terminal in Molingkapoto, which are passenger pickup points. This route often experiences deviations from several terminals that have connections to destinations that are not too far away. Usually, this can cause some conflicts due to competition for passengers and operational areas.

➢ *Route Deviations on the Route in Boalemo Regency (AB-02)*

The length of the route (AB-02) is 106 km. This route starts from Dungingi Terminal to Tilamuta Terminal located in Boalemo Regency. This route also passes through Isimu Terminal and Paguyaman District, which are places for passenger pickup. This route often experiences deviations from several terminals that have connections to destinations that are not too far away. Usually, this can cause some

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

conflicts due to competition for passengers and operational areas.

➢ *Route Deviations on the Route in Pohuwato Regency (AB-06)*

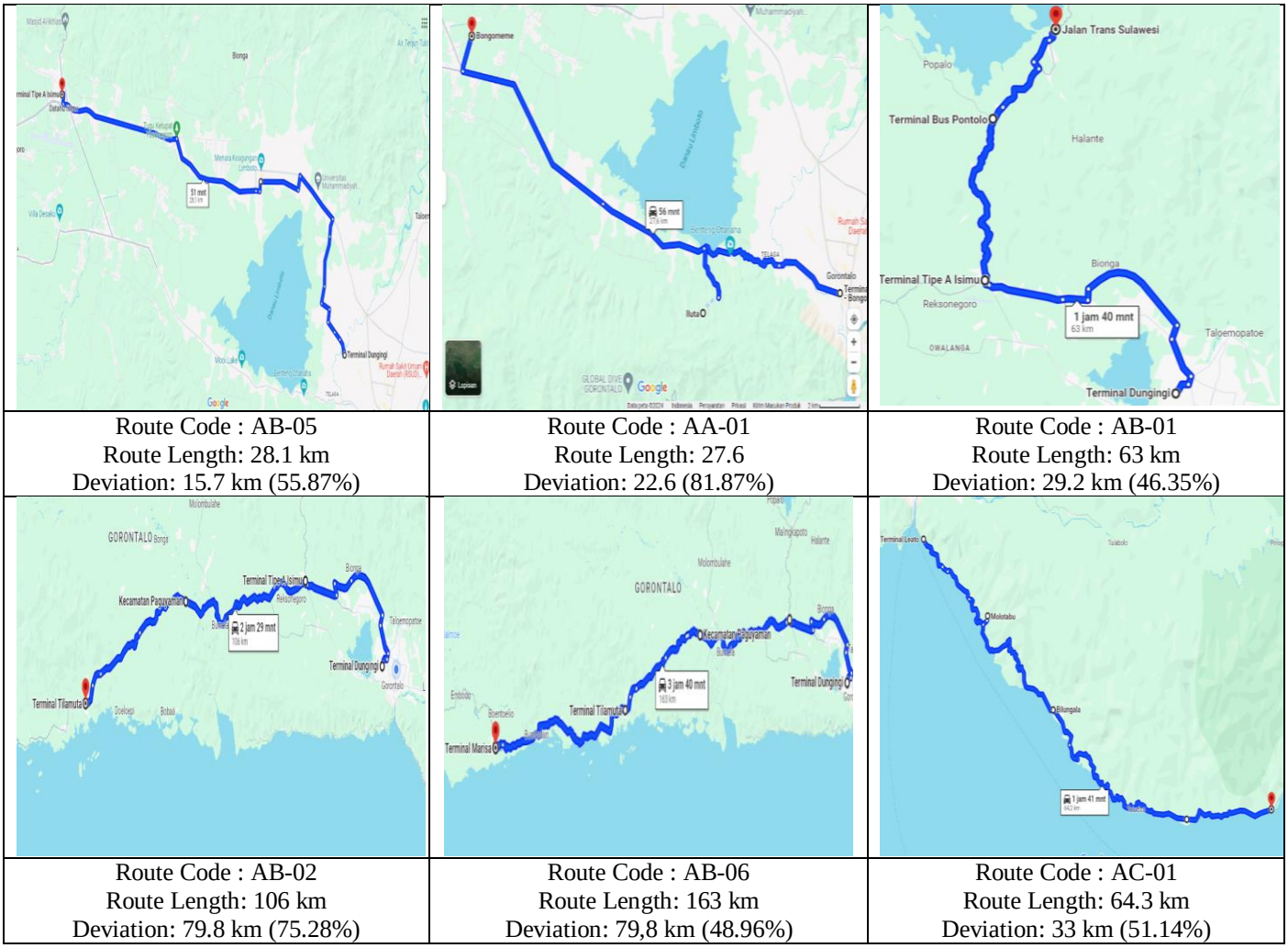
The length of the route (AB-06) is 163 km. This route starts from Dungingi Terminal to Marisa Terminal located in Pohuwato Regency. This route also passes through Isimu Terminal, Paguyaman District, Tilamuta Terminal, and Paguat District, which are places for passenger pickup.

This route often experiences deviations from several terminals that have connections to destinations that are not too far away. Usually, this can cause some conflicts due to competition for passengers and operational areas.

➢ *Deviation on the Route in Bone Bolango Regency (AC-01)*

The length of the route (AC-01) is 64 km. This route starts from Leato Terminal and goes to Taludaa in the Boneraya District of Bone Bolango Regency. This route also passes through Molotabu, Bilungala, which are passenger pickup points. This route often experiences deviations from several terminals that have connections to destinations that are not too far away. Usually, this can cause some conflicts due to competition for passengers and operational areas.

Spatially, the results of the analysis of AKDP Route Deviations that occurred in Gorontalo Province are as follows:



Route Code : AB-05 Route Length: 28.1 km Deviation: 15.7 km (55.87%)	Route Code : AA-01 Route Length: 27.6 Deviation: 22.6 (81.87%)	Route Code : AB-01 Route Length: 63 km Deviation: 29.2 km (46.35%)
Route Code : AB-02 Route Length: 106 km Deviation: 79.8 km (75.28%)	Route Code : AB-06 Route Length: 163 km Deviation: 79,8 km (48.96%)	Route Code : AC-01 Route Length: 64.3 km Deviation: 33 km (51.14%)

Fig 5: Spatial Deviation Analysis Results of the AKDP Route Network in Gorontalo Province

The level of route deviation refers to the extent to which public transportation vehicles operate outside the established route, which is caused by the route being deemed to have no passengers or being less productive. In the SPM LLAJ standards, route deviation can be tolerated if it is less than 25% [9].

IV. CONCLUSION

The study's findings indicate that Gorontalo Province's AKDP route service coverage is still uneven, with a number of localities without adequate service. On a number of major corridors, route overlaps have been found, leading to operational inefficiencies. There is considerable diversity in the routes' densities, with some being overcrowded and others being underutilized. An imbalance between the number of vehicles and the demand for passengers is also

ISSN No:-2456-2165 https://doi.org/10.38124/ijisrt/IJISRT24OCT1958

evident in the route ratio. It was also discovered that the path deviated from the predetermined plan, which could lower service reliability. In order to improve the effectiveness and caliber of transportation services in Gorontalo Province, it is advised that the route network be reorganized and that operational management be strengthened.

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