Evaluation of Microbus-Based Public Transport Services Quality during the Covid-19 Pandemic in Sorong City

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Abstract

This study aims to evaluate the performance quality of microbus-based public transportation facilities in Sorong City. Route A is the longest route with various land uses for trade, hotels, ports, stadiums, housing, schools, and offices. The COVID-19 pandemic and the rise of online taxi bikes have reduced the potential for this public transportation line. The research method is observation and analysis of service performance based on the Decree of the Director General No. 687/AJ.206/DRJD/2002. The evaluation results show that service time performance is in the medium category because there is no information on operating hours from 06.00-17.00 EIT, travel time is less than 12 km/hour, speed below 5 km/hour, and load factor less than 70-110%. However, the frequency of the number of vehicles operating, the headway, and the waiting time are optimal.

Keywords
Microbus-based public transport, service performance, load factor, frequency, headway

1. Introduction
High levels of population growth, migration, and vehicle ownership each year result in congestion on several roads. So, the availability of public transportation balances the density of roads due to high traffic volume and meets transportation needs (Mandaku 2021). The route in the city of Sorong has a circuit pattern with a starting and ending point route at the Pasar Remu, a type B terminal covering an area of ± 2160 sqm. According to the local Department of Transportation, there are four lines: Line A along ± 10.2 km with a total fleet of 408, Line B of ± 9.9 km with 397 units, Line E of ± 8.5 km with 158 fleets, and Line H of ± 8.9 km with 151 vehicles in 2022. Unfortunately, the WFH policy during the pandemic and the proliferation of online taxi bikes reduced the number of passengers. This research will use route A as a case study because it is the longest route with complex land use, including trade centres, hotels, settlements, offices, education, and other public facilities such as places of worship and stadiums. According to Vian Andrias Mabruwaru (2017), in his research entitled Analysis of Passenger Transport Performance in the city of Sorong Case Study of Route A, the overall performance on weekdays, weekends, and holidays is in a good category through static and dynamic surveys. Public transportation needs 12 units for one cycle and 46 units during peak hours with a headway of 4.6 minutes. However, the research was conducted in 2017, before the pandemic and the rise of online transportation applications. In addition, although the performance of the route service has decreased, its existence is

still needed, especially for people who cannot use motorbikes, such as school children, housewives, and traders. White in Tanjung and Dirgahayani (2021) state that the primary role of public transport for school trips determines the number of vehicles during peak hours.

1.1 Objectives

Based on previous research and current field phenomena, this study aims to assess the level of microbus-based public transportation services of route A, Sorong City.

2. Literature Review

2.1 Passenger Public Transport

According to the Law of the Republic of Indonesia Number 22 of 2009, concerning Road Trafficand Transportation, public motorized vehicles are any vehicle used to transport goods or people for a fee divided into city transportation according to the route.

2.2 Previous Researches

There are many similar studies on evaluating the operational performance of public transport,some of which are as follows:

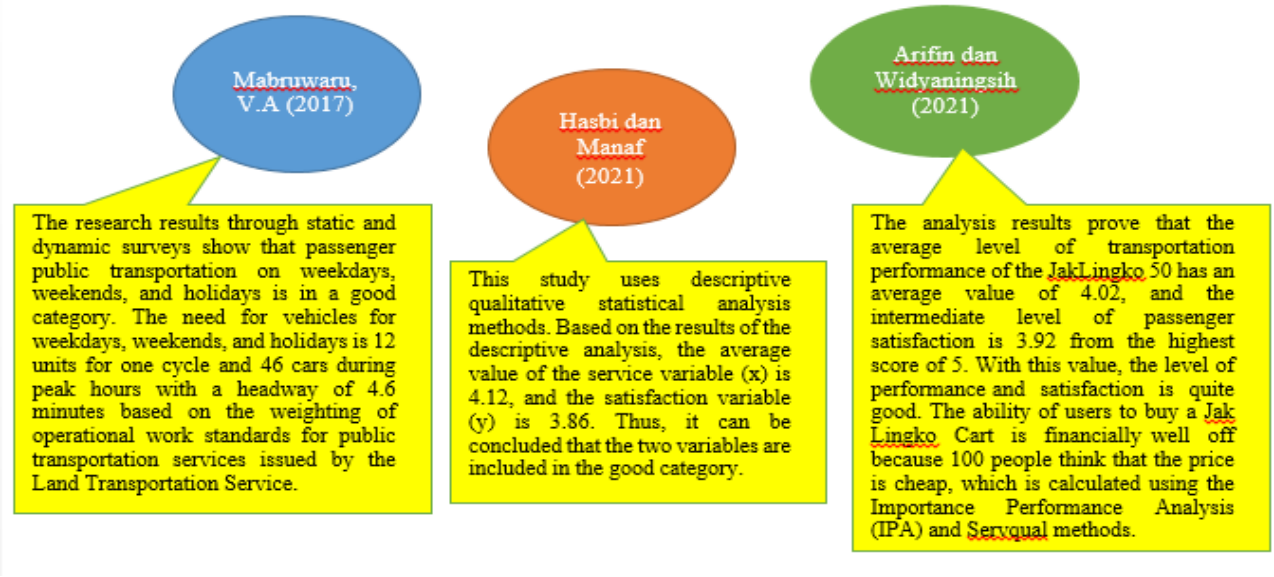


Figure 1. Literature Review

Based on previous research, two studies belonging to Hasbi and Manaf 2021 and Arifin and Widyaningsih, N (2021) used descriptive qualitative statistical methods and importance performance analysis, while Mabruwaru used public transportation performance analysis SK Director General No. 687/AJ.206/DRJD/2002. This refers more to Mabruwaru where there are similarities in objects and methods but what distinguishes Mabruwaru the research was carried out before the Covid-19 pandemic, while in this study it was carried out during the Covid-19 pandemic

3. Methods

In order to achieve the objectives of the analysis in the study area, several stages were deemed necessary, of which the implementation procedure broadly consisted of the following stages:

a. Field survey

The survey was conducted five days in April starting Saturday April 7 for weekends, Sunday April 8 for holidays and April 9 – 11 on weekdays in 2022 starting Monday Tuesday Wednesday including:

1. DYNAMIC SURVEY ON MICROLETE

Done in public transport vehicles that are in operation. The target data obtained include: number of passengers, vehicle load factor (peak and off peak), travel time and average speed, location of passenger pockets and route realization.

2. STATIC SURVEY

Conducted at terminals and roads (at checker/timer locations) or at passenger pocket locations and the target data collected are: number of passengers, vehicle load factor (peak and off peak), frequency.

b. Analysis

this analysis based on performance of public transportation – SK Dirjen No 687/AJ.206/DRJD 2002

4. Data Collection

Primary data from the static and dynamic survey was conducted for five days in April, startingSaturday, April 7 for weekends, Sunday, April 8 for holidays, and starting Monday, April 9 – 11 for weekdays in 2022, to obtain data on the number of passengers on each segment, speed, waiting time, and so on. It is then compared with the Decree of the Director General No.687/AJ.206/DRJD/2002 to obtain an overview of the route's performance, as shown in thefollowing figure.

Figure 2. Survey Activities

5. Results and Discussion

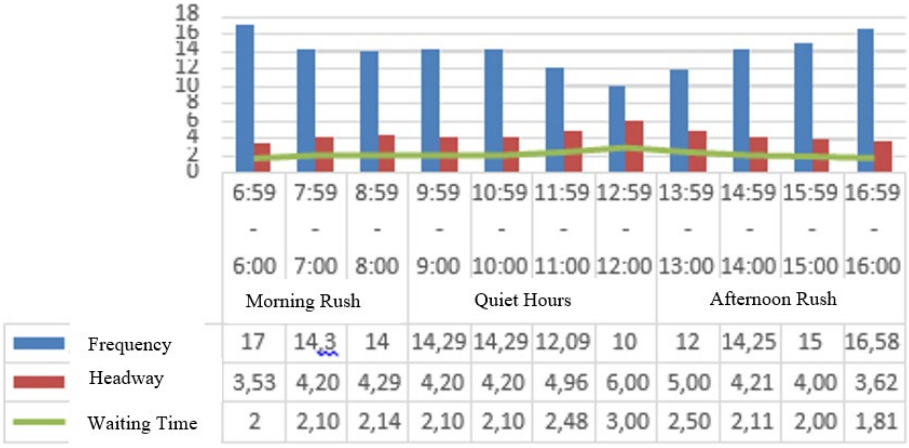
5.1 Route

Based on the field survey, route A is almost the same as the others, with a circuit pattern that starts and ends at Remu Passenger Terminal. The difference lies on the long route by passing through Jenderal Sudirman-Rumberpon-Basuki Rachmat-A. Yani-Yos Sudarso-Arfak-Sam Ratulangi-Diponegoro-Rufei-Yos Sudarso-A. Yani-Bubara-General Sudirman-Pasar Sentral- Remu Terminal. If it is associated with land use on each of these routes, it passes through settlements, hotels, offices, trade, education, seaport, places of worship, and sports stadiums. Below is a picture of the track and some information about the land use of the main roads.

Figure 3. Routes and Land Use of the Main Road of Route A

5.2 Frequency, Headway, and Waiting Time Comparison

Vehicle frequency analysis is carried out by calculating the number of public transport passengers that stop and pass in the segment being reviewed from 6.00-17.00. Headway is the vehicle interval related to the hourly frequency. The following compares the frequency and headway during its operational time



	6:59 - 6:00	7:59 - 7:00	8:59 - 8:00	9:59 - 9:00	10:59 - 10:00	11:59 - 11:00	12:59 - 12:00	13:59 - 13:00	14:59 - 14:00	15:59 - 15:00	16:59 - 16:00
	Morning Rush			Quiet Hours				Afternoon Rush			
Frequency	17	14,3	14	14,29	14,29	12,09	10	12	14,25	15	16,58
Headway	3,53	4,20	4,29	4,20	4,20	4,96	6,00	5,00	4,21	4,00	3,62
Waiting Time	2	2,10	2,14	2,10	2,10	2,48	3,00	2,50	2,11	2,00	1,81

Figure 4. Frequency, Headway, and Waiting Time Comparison

From this analysis, it can be seen that the highest frequency is during the morning rush hour at06.00-06.59 with 17 vehicles per hour, while the lowest is in the off-peak hour at 12.00-12.59 of 10. The relationship between frequency and headway is inversely proportional; the higher the frequency, the lower the headway. Frequency is the number of vehicles that stop and pass in the area we are surveying, while headway is the intermediate time.

So, the more vehicles pass, the shorter the time between them. Based on the analysis graph above, it is found that thelongest headway is in off-peak hours at 12.00-12.59 of 6 minutes, while the fastest one is in themorning and evening rush hours at 06.00-06.59 and 16.00-16.59 of 3.5 minutes. Headway is directly proportional to the waiting time obtained from calculating the average time value of passengers who stop on the observed road. From the analysis results, it can be concluded that the longest headway at off-peak hours is 12.00-12.59, the waiting time value is directly proportional to 3 minutes, and the fastest one is 3.53 minutes with a waiting time of 2 minutes. The results are then compared with the performance of public transportation in the Decree of the Director General No.687/AJ.206/DRJD/2002. According to a good standard, the frequencyvalue is > 6; the lowest frequency at off-peak hours at 12.00-12.59 is ten vehicles/hour. Then for the best headway by standards of less than 10 minutes, the highest on the field at the same off-peak hour is 6 minutes. However, the waiting time is good if the value is less than 20 minutes, while the longest waiting time is 3 minutes. Overall, it can be said that the route's performance in terms of frequency, headway, and waiting time is good.

5.3 Travel Time and Speed

The longest travel time in one cycle on weekdays and weekends is 19.33 minutes/km during off-peak weekends, which is more than 12 minutes/km. The assessment standard is not good basedon the 2002 Land Transportation Service regulations. The waiting time is very long because many drivers wait for passengers at the terminal. The lowest speed on weekends or holidays of 3.6 km/hour, less than 5 km/hour, which means the standard is not good. The speed is in segmentone, from the terminal to the Simpang Polresta, an office area.

5.4 Comparison Of Load Factor With Number of Passengers

The dynamic load factor is expressed as a percentage. The calculation is done by dividing the number of passengers by the carrying capacity to get the average value each day, both during busy times, usually in the morning or evening, and during quiet hours, weekdays (Monday), weekends (Saturday), and holidays (Sunday).

Table 1. Load Factor and Number of Passengers

Time	LOAD FACTOR (DYNAMIC) (%)					
	Workdays		Weekend		Holiday	
	Total passengers	LF 1 cycle	**Total passengers**	LF 1 cycle	**Total passengers**	LF 1 cycle
Morning rush hour	43	45%	33	28%	25	21%
Off hours	34	35%	36	30%	34	28%
Afternoon rush hour	33	40%	38	32%	35	28%

The calculation above shows the largest percentage occurs in the morning rush hour on weekdays at 45%. However, this percentage is far below the standard set by the Directorate General of Land Transportation of 70-110%. It indicates that the public transport route passengers are less than optimal in serving the movement of passengers.

6. Conclusion

The discussion above concludes that several things cause poor route performance. The first is the unavailability of information on service times at the terminal or the stopping point. Second, travel time and speed because the lowest rate is below 5 km/hour. The longest travel time is less than 12 km/hour in segment 1, which has office land use from the Remu-Simpang Polresta Terminal on holidays. Third, the largest dynamic load factor value of 45% is less than 70-110% in weekday morning rush hour. It indicates that the route is less than optimal in serving the movement of passengers, which can be due to the pandemic's movement restrictions and the increasing number of online taxi bikes. However, the frequency of vehicles, the time between, and the waiting time are optimal with good service.

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Biography

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