

OPERATIONAL PERFORMANCE AND SERVICE LEVEL OF MALANG CITY PUBLIC TRANSPORT LDH/G DURING THE COVID-19 PANDEMIC

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Abstract: Competition for transportation modes such as ojol causes a lack of interest in passengers using angkot. Some of the other impacts caused by Covid-19 on city transportation, namely, a decrease in the number of passengers from 15 people in normal conditions to only around 3-4 people in the Covid-19 pandemic in one trip. During the Covid-19 pandemic many angkot stopped operating because it was very hard to get passengers. So not infrequently some angkot finally turn back to the departure terminal and end up returning home from work at noon. The method used is by distributing questionnaires to drivers and users of angkot suits for characteristics and for the level of service, where for the level of service followed by data processing using the IPA method with a Likert scale. For operational performance, static and dynamic field surveys are carried out. Based on the results of the research, the results of the operational performance of LDH/G public transportation are between 2-11 minutes in the good category, the travel time is 51 minutes in the good category, and the circulation time is 1 hour 28 minutes in the good category. As for the level of service that needs to be improved, namely the convenience aspect in the form of the availability of trash bins, the health protocol aspect of having a cross (X) on the seat and the availability of trash bins. For the level of service that needs to be maintained, namely the security aspect in the form of vehicle identity and the presence of lights, the safety aspect in the form of vehicle feasibility, the comfort aspect of passenger capacity and the presence of windows, the affordability aspect in the form of route suitability, the suitability of the tariff paid, and the health protocol aspect in the form of service user obligations. wearing a mask

Keywords: public transportation, operational performance and service level

1. INTRODUCTION

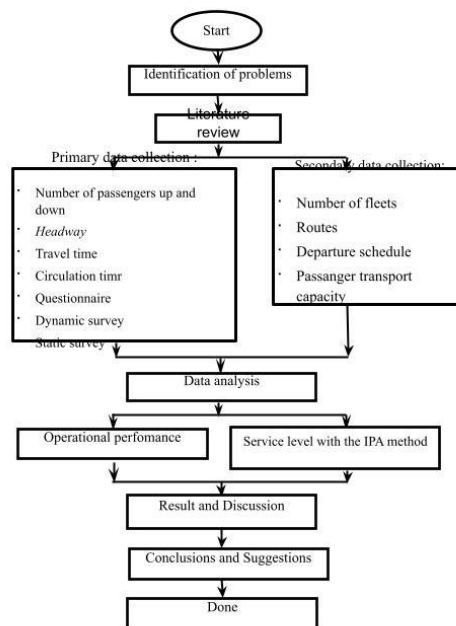
The increase in urban development is due to the diversity of community activities, this has a positive impact on the economy and city development. With the tendency of people to use transportation modes, the increase in population activity in urban development will be directly proportional to the increase in community needs for the use of both private and public transportation as facilities and infrastructure in supporting the success of activities in cities and villages (Bureau of Communication and Public Information, 3 October 2017).

According to Hardaya (2017), transportation is a means in the form of a vehicle to move people and or goods from one place to another with the aim of reaching the destination. While public transportation is transportation that uses public transportation with a pay or rental system. Transportation that has an urban area with a certain route is called urban transportation. City transportation operating in Malang has 25 transportation codes with different routes. These transportations have routes that match the alphabetical code listed on the name of the transportation.

Due to the many problems in the field during Covid-19, the city of Malang experienced changes that had a major impact on economic and social life, such as reduced activities outside the home, resulting in a decrease in people's need for using public transportation such as city transportation. Some of the other impacts caused by Covid-19 on city transportation, namely, a decrease in the number of passengers from

15 people in normal conditions to only around 3-4 people in the Covid-19 pandemic in one trip and a decrease. In addition, the number of city transportation fleets operating is 170 units from normal conditions to 60 active units and 35 units per day traveling during the Covid-19 pandemic conditions. Based on the above conditions, it is necessary to evaluate the service and performance of city transportation on the LDH/G route. This is intended to further increase the interest of the public to use city transportation as their means of transportation. City transportation services during the Covid-19 pandemic need to be considered in their health protocol services.

2. METHOD



Gambar 3.1 Diagram Bagan Alir Penelitian

This research uses a descriptive type of research with a survey approach. As a guide in conducting research, a flow chart is needed which contains the steps of the research procedure which can be seen in Figure 3.1. The research sampling technique uses a random sampling technique, which is carried out by giving the same possibility for people who are members of the population to be selected as research samples (Winarsunu, 2017:15). Sampling that has the opportunity to be selected in accordance with the wishes of the researcher on a population to be studied. To determine the size of the sample to be used, it is obtained by the Solvin formula (Asra, et al, 2016:89) in equation 3.1

$$Qn = \frac{N}{1+Ne^2} \dots\dots\dots (3.1)$$

Keterangan :

- n = ukuran sampel
- N = ukuran populasi
- e = persen kelonggaran ketidaktelitian karena kesalahan pengambilan sampel (10%)

To find out the number of samples, use equation 3.1 and get the results:

$$n \text{ penumpang} = \frac{1250}{1+1250 \cdot 0,1^2}$$

$$= 92,5925 \approx 93$$

$$n \text{ armada} = \frac{50}{1+50 \cdot 0,1^2}$$

$$= 33,333 \approx 33$$

Research variable

Tabel 3.1 Variabel Kinerja Operasional

Variabel	Sub Variabel	Indikator	Instrumen Penelitian
Kinerja Operasional	Travel speed	Divide the distance traveled by the time traveled in a certain period (expressed in km/hour)	Dynamic survey
	Load factor	Divides the total occupied capacity by the total available capacity on one trip (expressed as a percent %)	Static survey and Dynamic survey
	<i>Headway</i>	The time between the arrival of one transport and the departure of the next transport (expressed in minutes)	Static survey
	Time travel	The length of time for one trip from the starting place to the final stop (expressed in minutes or hours)	Dynamic survey
	Time circulation	Time taken for one trip from origin to final destination and then back to origin (expressed in minutes or hours)	Static survey and Dynamic survey

Tabel 3.2 Variabel Tingkat Pelayanan

Variabel	Sub Variabel	Indikator	Instrumen Penelitian	
Tingkat Pelayanan	Security	Vehicle identity	Vehicle number and route name in the form of a sticker	Questionnaire
		Driver identity	Using the driver's uniform and ID card	Questionnaire
		Lighting	Serves as an explanation	Questionnaire
		Tinted window	Coating on the windshield of the vehicle to reduce the entry of sunlight	Questionnaire
	Safety	Checking the vehicle to be used	Eligibility of the vehicle to be used during the trip according to the standard	Questionnaire
		Safety facility	Safety equipment is available in an emergency and procedures for use include: glass breaker, and light fire extinguisher.	Questionnaire
		Entrance and exit access	Door position during travel (open or closed)	Questionnaire
	Comfort	Driver competence	Driver's knowledge of the route traveled and skills in driving	Questionnaire
		Angkot capacity	The suitability of the number of passengers per vehicle	Questionnaire
		Air circulation facility	There is air circulation in the form of windows that can be opened and closed.	Questionnaire

	Cleaning facility	There is a trash can or at least a plastic bag for disposal	Questionnaire
Affordability	Aksesbilitas	Provide services in accordance with predetermined routes	Questionnaire
	Cost	Costs incurred by passengers for one trip	Questionnaire
Equality	Priority service	Giving priority to get on or off the vehicle (handicapped, elderly, children, and pregnant women)	Questionnaire

In preparing the research, data is needed which is divided into two types, namely: 1) Primary data, obtained by conducting surveys and distributing questionnaires; and 2) Secondary data, obtained from several literacy references and information from related agencies.

3. RESULT AND DISCUSSION

3.1 Operational Performance

1) Speed

Speed is the rate of travel which is usually expressed in kilometres per hour (km/h). Based on the results of research and data processing in Table 4.19 and Table 4.20 for the speed of travel towards Landungsari on weekdays and holidays the highest with the result of 21.00 km/hour on weekdays in the morning and the lowest in the afternoon of 18.22 km/hour on holidays. While in Table 4.21 and Table 4.22 the travel speed from the Gadang direction has the highest results, namely in the morning at 20.20 km/hour on weekdays and the lowest in the afternoon at 18.60 km/hour on holidays.

2) Faktor muat

Load Factor is the ratio between the capacity that has been filled with the available capacity in one trip, which is usually expressed in percent (%). **Distribusi Pola Pergerakan Penumpang Naik Turun**

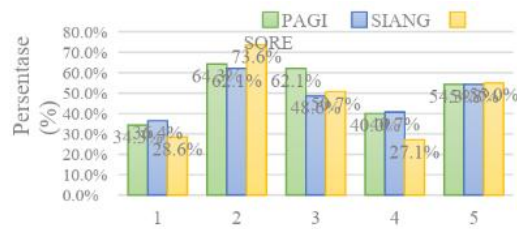
Distribusi Pola Pergerakan Penumpang Naik Turun

Gadang – Landungsari



Gambar 4.21 Diagram Pola Pergerakan Penumpang Naik dan Turun Arah Landungsari

Arah Landungsari Survei Statis



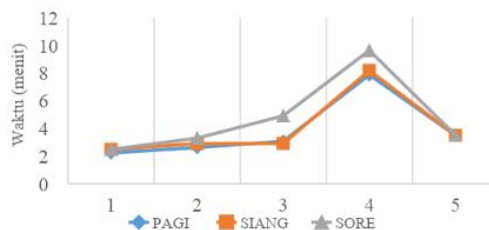
Gambar 4.27 Diagram Faktor Muat Rata-rata Survei Statis Pada Hari Kerja Arah Landungsari

The loading factor of the average static survey in the Landungsari direction has the highest result in the afternoon at point 2 of 73.6% on weekdays and the lowest in the afternoon at point 4 of 27.1% on weekdays. Meanwhile, the load factor for the average static survey of the gadang direction which has the highest results is in the morning at point 2 at 65.8% during weekdays and the lowest in the afternoon at point 4 at 25% during the day. For more detailed loading factor research results, there is data processing in the form of up and down passenger movement patterns which can be seen in Table 4.23 and then with the highest movement results, namely in zone 1 for boarding passengers and in zone 3 for descending passengers.

3) Headway

Headway is the distance between one city transportation vehicle and another city transportation that is sequentially behind it on the same route.

Arah Landungsari



Gambar 4.32 Diagram *Headway* Rata-rata Pada Hari Libur Arah Landungsari

Arah Gadang

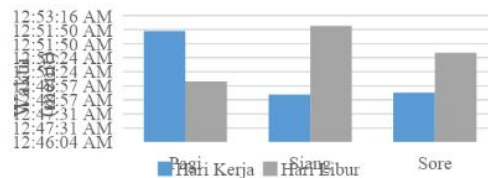


Gambar 4.34 Diagram *Headway* Rata-rata Pada Hari Libur Arah Gadang

So it can be seen from the results of the study that the average time between LDH/G public transportation is between 8-11 minutes and the maximum time between the occurrences occurs in the afternoon during holidays.

4) Time travel

Travel time or travel time is the total travel time of a mode from origin to destination with a certain route. This required time includes the delay time and stop time of a mode.



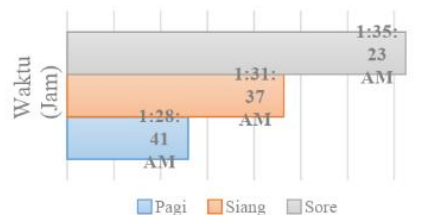
Gambar 4.35 Diagram Waktu Tempuh Rata-rata Arah Landungsari

Based on the results of research and data processing in Table 4.40 during weekdays and Table 4.41 during holidays it can be seen that the average travel time from the Landungsari direction which has the highest travel time is 52 minutes 2 seconds on holidays during the day and for the lowest travel time. occurs during the day on a weekday for 48 minutes 31 seconds. Meanwhile, the travel time from the Gadang direction is in Table 4.42 for weekdays and Table 4.43 for holidays which has the highest result, which occurs in the morning during holidays for 54 minutes 35 seconds and for the lowest travel time occurs in the morning on weekdays for 50 minutes. 48 seconds.

5) Time circulation

Circulation time is the time required for passenger transport vehicles to serve the route in one trip (departing suddenly) starting from the place of origin to the destination and then back to the place of origin.

Arah Landungsari



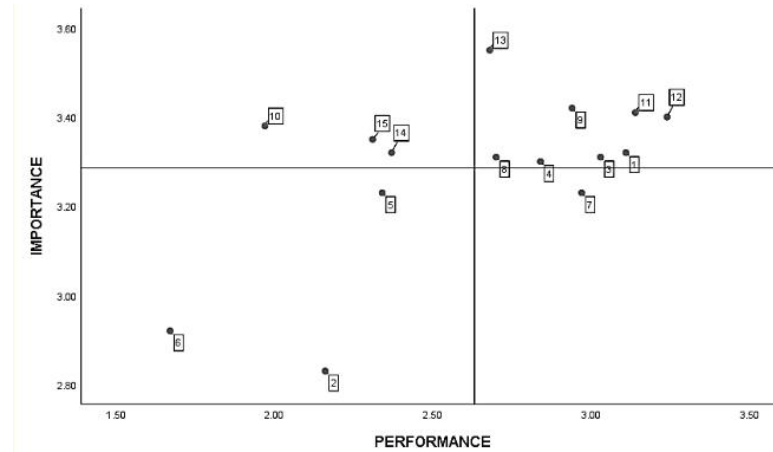
Gambar 4.38 Diagram Waktu Sirkulasi Rata-rata Pada Hari Libur

So it can be seen from the results of the study that the average circulation time of the highest LDH/G angkot is 1 hour 35 minutes 23 seconds and the maximum circulation time occurs in the afternoon during holidays.

3.2 Service Level

The level of transportation services is the ability of service providers to provide and fulfill services to service users in several predetermined aspects such as security, safety,

comfort, affordability, and equality. This level of service can be evaluated using the IPA (*Importance Performance Analysis*) method by providing an assessment by service users which can then be used as material for improvement in terms of performance and importance with the help of a *Likert* scale rating score.



Gambar 4.41 Diagram Kartesius IPA

In Figure 4.41 it can be seen the results of service users' assessments of LDH/G city transportation services, among others:

1. In quadrant I there are 3 attributes that need to be considered for the level of performance, namely the comfort aspect on the 10th attribute in the form of the availability of cleaning facilities such as trash cans, then on the 14th and 15th attribute Health protocol aspects in the form of a warning to keep your distance on the seat and availability hand sanitizer. In quadrant I has a coverage result of 20% of the number of attributes.
2. In quadrant II there are 8 attributes that must be maintained at the level of performance and importance, namely the security aspect of the 1st attribute in the form of vehicle identity and the third attribute of the presence of lights as lighting. For the safety aspect, the 4th attribute is the feasibility of the vehicle to be used. The comfort aspect on the 8th attribute is that there are not too many passengers and the 9th item has windows for air circulation. The affordability aspect of the 11th attribute is the suitability of the route passed and the 12th item is the suitability of the angkot fare. And the 13th attribute health protocol aspect is the obligation of passengers to wear masks. In quadrant II includes the results of 53% of the total attributes.
3. In quadrant III there are 3 attributes which in this quadrant need to be improved for performance and importance because both of them have low values. In the security aspect, there is a second attribute in the form of a driver's identification. Then the 5th attribute and 6th attribute are the position of the angkot door and the availability of safety facilities in an emergency such as a glass bat, both of which are included in the safety aspect. In quadrant III includes the results of 20% of the total attributes.
4. In quadrant IV there is only 1 attribute where in this quadrant is considered to have an excessive level of performance. Included in the safety aspect on the 7th attribute, regarding the driver's knowledge in driving. In quadrant VI includes results of 7% of the total attributes.

4. CONCLUSION

4.1 Operational Performance

1. Travel Speed with results of 18-21 km/h with Performance Standards of 10-12 km/h falls into the category of less good
2. Static Load Factor with a yield of 46% and a dynamic load factor of 40% with a Performance Standard of 70% in the poor category.
3. The average headway is between 2 – 11 minutes with Performance Standards of 5-10 minutes in the good category.
4. The average travel time with the highest result is 54 minutes 35 seconds with a Performance Standard of 1 hour in the good category.
5. The average circulation time is 1 hour 35 minutes 23 seconds with a Performance Standard of 1.5 hours in the good category.

4.2 Service Level

The results of the service level of LDH/G public transportation that need to be improved are:

In quadrant I with a low level of performance as many as 3 attributes of 20% of the total, namely:

1. The convenience aspect is the availability of minimum cleaning facilities for plastic bags.
 2. The health protocol aspect is that it is mandatory for every transportation to have hand sanitizer available and a cross is given at each distance of one seat as a sign of maintaining distance considering that there is currently a Covid-19 pandemic.
- For quadrant II, there are 8 attributes that must be maintained and are top priorities and cover the results of 53% of the total, including:

1. Security aspects in the form of vehicle identity and the presence of lights as lighting.
2. Aspects of safety in the form of the feasibility of the vehicle to be used.
3. The comfort aspect for many passengers is not excessive and there are windows for air circulation.
4. The aspect of affordability is the suitability of the route passed and the suitability of the angkot fare.
5. Aspects of health protocols in the form of the obligation of passengers to wear masks.

5 REFERENCE

- Asra, I., Irawan, P, B., & Purwoto, A. 2016. *Metode Penelitian Survei*. Bogor: IKAPI (Penerbit IN Media)
- Biro Komunikasi dan Informasi Publik. 2017. *Transportasi Sebagai Pendukung Sasaran Pembangunan Nasional*. Online, diakses tanggal 6 Agustus 2021.
- Hardaya, Urai Kharisma. 2017. *Kajian Operasional Angkutan Kota di Tanjungpinang (Studi kasus:Angkutan Kota Trayek B)*. Tugas Akhir. Bandung: FT Universitas Pasundan.

Winarsunu, T. 2017. Statistik Dalam Penelitian Psikologi dan Pendidikan. Universitas Negeri Malang: APPTI (Asosiasi Penerbit Perguruan Tinggi Indonesia)